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Trailers Facilitate Heavy Haulage

Advantages for Transporting Long Girders and Beams—Better Distribution of Loads with Less Road Wear and Lower Operation Costs

— BY DONALD MCLEOD LAY* —

THE trailer is an important adjunct to heavy motor-truck haulage and its advantages for use in transporting weighty and bulky materials make it especially well adapted for use in the iron and steel industry. In many ways, in fact, the combination of trailer and truck or tractor for heavy haulage represents an improvement over the motor truck that is comparable in turn to the advance of the motor truck over the old-timed eight or ten horse-drawn long wagon.

The fact that the cost per ton mile for hauling decreases rapidly as the size of the truck increases is well known and is borne out by figures given in the table below, but at the same time many disadvantages of heavy trucks are wiped out by the adoption of trailers while certain advantages are retained. The following figures which show the reduction of costs per ton mile by using bigger trucks were worked out by a company which operates a fleet of fifteen trucks:

Operating Cost of Motor Trucks in Cents Per Ton-Mile				
Load	5-Ton Truck	3-Ton Truck	2-Ton Truck	¾-Ton Truck
5 tons	6.9	...	...	...
4 tons	8.9	...	...	...
3½ tons	10.0	...	...	...
3 tons	11.5	10.5	...	...
2½ tons	17.25	15.75	13.5-14.15	...
2 tons	23.0	21.0	18.0-19.0	...
1½ tons	34.6	31.5	27.0-28.3	17.08
¾ ton	51.0	42.0	36.0-37.5	22.75

Thus it can be seen from these figures that it

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would be to the advantage of the man in the iron trade to have a large truck rather than several small ones. On the other hand, the increase in operating expense per ton mile is rapid when the truck is not used to full capacity load. Moreover, the average road in this country is not built for heavy motor traffic, which tends to break up the surface of the highways and thus add greatly to the expense of their maintenance. Therefore, to discourage the use of heavy trucks, many states impose a practically prohibitive registration fee.

The use of the trailer obviates the difficulties just presented, for by combining a trailer with a motor truck, automobile or tractor, the two vehicles will have a load capacity of from two to three times that of the motor vehicle alone, the exact figure depending upon the type of trailer used and other factors, and since the load will be more evenly distributed, the wear and tear on the roadbed will not be so great. The additional operating expense for the truck or tractor will not exceed 25 per cent, most of this representing the cost of additional gasoline consumed.

In this connection it is also important to remember that the initial cost of a trailer is only about one-fourth to one-third that of a truck of the same load capacity. No extra driver is required; there is practically no repair expense to be charged to the trailer; in fact, the avoidance of overloading due to the use of the trailer materially reduces the repair charges on the truck; and finally, the items of tire



Method of Handling a Long, Wide Load of Structural Steel Using a Four-wheel Trailer with Truck Both Being Equipped with Swiveled Bolsters

wear and fixed charges are low. Thus the cost of upkeep of the trailer is not to be considered in comparison with that of a truck of the same size. Hence it is a conservative statement to make that the use of trailers reduces transportation costs 50 per cent.

Hauling Long Objects

Moreover, where beams, girders, etc., longer than 25 ft. are to be transported, the trailer is practically a necessity, for no motor truck could properly support a heavy object of this length, to say nothing of its ability to stand the strain of the tremendous weight of such a mass of iron or steel. When a trailer is used the weight is distributed between it and the truck, neither being required to sustain an undue share. This also serves to preserve the highway surface.

The following selected examples of practical trailer application by firms in the iron and steel industry are of special interest, particularly so because in several instances they strikingly illustrate the peculiar adaptability of the trailer to meet unusual conditions.

The Bourne-Fuller Co., Cleveland, Ohio, for example, has found the trailer highly satisfactory in facilitating the rapid handling of unusually long and heavy steel building units. A five-ton, two-wheel trailer is used in connection with a five-ton truck

The use of trailers has enabled the Valley Iron Works, Williamsport, Pa., to solve economically and efficiently its special transportation problems. For this purpose it is operating an equipment consisting of a 10-ton, four-wheel trailer and a five-ton semi-trailer, the latter being attached to the truck by the usual fifth-wheel arrangement and the four-wheel trailer being hitched to the semi-trailer. The semi-trailer is, as shown herewith, used to carry miscellaneous iron products, while the four-wheeler is employed for hauling a retort. The load capacity of the semi-trailer is 10 tons and that of the four-wheel trailer 22 tons, making a total of 32 tons.

A remarkable incident, showing the efficiency of trailer combination in hauling steel girders, and also demonstrating forcibly the manner in which the weight of the load is distributed by means of the combination, occurred recently in connection with a job of the Mosher Mfg. Co., Dallas, Tex.

The company was using a five-and-a-half-ton pipe trailer coupled to a four-wheel-drive truck, for hauling a steel girder 42 ft. 6 in. long and weighing 24,200 lb. This girder was intended for the Federal Reserve Bank of Dallas. As the girder was being lifted by a large steel derrick, and when the mass of steel, weighing over 12 tons, was about $1\frac{1}{2}$ ft. above the trailer and truck, the derrick broke, dropping the girder on the combination of vehicles. In



With this combination it is possible to transport easily beams 60 ft. long, a feat that would be impossible by the use of the truck alone. Carrying a 10-ton load is an ordinary performance for this vehicular unit.

An arrangement that has been found efficient in structural steel work, in handling beams that are too long to be handled on a truck alone, especially when the load is a wide one, consists of a motor truck with a four-wheel trailer. Both the truck and trailer are equipped with a swiveled bolster, which enables the load to be backed where required. It may even be drawn through a factory gate from the street, at right angles, this being accomplished by steering the trailer to make it turn in the same circle as the truck. A two-wheel trailer, equipped with a knuckle axle, to allow for steering, has also been found to operate effectively on work of this kind.

The method of using a truck with a four-wheel trailer was a favorite one during the rush of war work and it was just such ingenious arrangements as this which helped to accomplish so much in the way of construction under the stress of wartime requirements.

spite of the tremendous force of the blow caused by the fall of this great weight, the truck and trailer were uninjured. It is safe to say that, had the girded fallen on the truck alone, the latter would have been considerably damaged. The loading and delivering of this girder consumed only three-quarters of an hour.

Handling Long Pipes

Trailers have also been found useful for transporting pipe in the Texas oil fields and elsewhere. For this purpose a two-wheel trailer with a sliding bolster is used. This sliding bolster arrangement enables the trailer to turn corners without causing the pipe to jam, or other trouble resulting. The principle is, of course, applicable to the transportation of any long, thin strip of iron or steel of similar nature.

Where motor trucks without trailers are used in the iron and steel industry, there is always considerable time lost in waiting for the trucks to be loaded or unloaded. Not only is the high-priced truck standing idle during such periods—which may in some cases total, on an average, a fourth of the working day—but the driver is also waiting and it



Five-and-a-Half-Ton Trailer, with Four-Wheel Drive Truck Successfully Transporting a Steel Girder 42 Ft. 6 In. Long, Weighing 24,200 Lb.

may frequently happen that the time of other workers may be lost, while they are waiting for material which the truck is to deliver.

Eliminating Time Loss

By far the greater part of this waste is eliminated when the trailer is used. For the trailer may be loaded or unloaded while the motor truck is making its trip and on the latter's return the trailer may be hitched up again with only a few minutes' delay. Moreover, since the cost of the trailer is only about one-third or one-quarter of that of the truck, the loss involved when the former is standing idle while it is being loaded or unloaded is considerably less than when the truck must be kept waiting for this purpose.

An example which clearly shows how the efficient use of trailers materially reduces transportation costs is furnished by the methods employed by the Velick Scrap Iron & Machinery Co. of Detroit, Mich. The principles embodied—modified, of course, to meet individual conditions—could doubtless be profitably applied to the operation of the transportation department of many iron and steel manufacturing establishments.

The Velick company found several years ago that the cost of removing scrap material by means of motor trucks and horse wagons was unduly high; in fact so high as almost to make the business unprofitable, the excessive expense being caused by the loss of time in loading and unloading the motor trucks, or in the slowness of transportation by the horse-drawn vehicles.

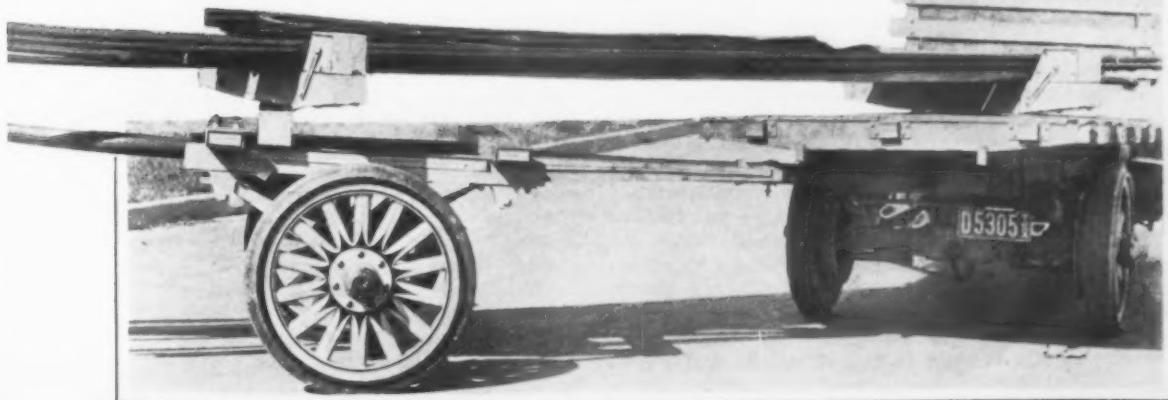
As an experiment, five five-ton trailers were installed to replace some of the vehicles then in use. These trailers proved so satisfactory that five more of the same size and type were added to the equipment.

The plan of operation is as follows: The motor truck starts from the yard of the company with two empty trailers. These are left at two factories to be loaded. While these are being loaded, the truck is on its way to a third factory, where it takes on a loaded trailer, stopping on the way back to pick up the other two trailers, which are now ready and which are attached without delay. Thus the truck, with the help of the trailers, is able to transport on a single trip 15 to 20 tons, instead of the maximum of five tons, which it could carry alone. When the truck with the trailers returns to the company's yard, the vehicles are unloaded simultaneously into different waiting freight cars, so that the truck is required to remain idle no longer than is necessary for it to be unloaded. It is also worthy of note that the repair expense of these ten trailers, over a period of more than 13 months, averaged only \$16.27 per trailer, or at the rate of about \$1.20 per month.

Trailer manufacturers are studying more and more carefully the requirements of various industries and are successfully adapting construction to the peculiar needs of each. In fact, they even go so far as to adapt their trailers to local topographical conditions. For instance, in the flat country of the Middle West the roads are laid out in section lines. Hence they are straight and cross each other at right angles. The part of the road used for traffic is narrow and consequently the turns are extremely abrupt. To overcome this a certain trailer manufacturer has put on the market a short-turn trailer with front and rear steering wheels. Since axles connected by hardwood reaches are used, the axles turn in opposite directions, but at the same angle, and the wheels therefore follow in the exact track of the rear wheels of the truck drawing the trailer.

In the same way, the manufacturers are study-

Trailer Used for Transporting Pipe in Texas Oil Fields.
Use is made of a sliding bolster which enables the trailer
to turn corners without jamming the pipe.





ing the conditions of trailer use in the iron and steel industry and constantly developing improvements in design and construction for this work.

The best type of modern trailer embodies all the most desirable features of automotive construction,

including devices for overcoming the results of the strains to which it is put, and which would quickly rack the ordinary wagon to pieces. Numerous accurate records showing extraordinarily low cost of upkeep testify to the efficiency of the trailer.

Heat Treatment of Gears a Dependable Operation

Discussion of the Hump Process—Effects of Different Heating Rates—Operating Costs

THE "hump" process for the heat treatment of gears was described in detail by G. W. Tall, Leeds & Northrup Co., Philadelphia, at the recent convention of the American Gear Manufacturers' Association, Detroit. This method, which was described in THE IRON AGE, issue of March 11, utilizes the critical or transformation point to indicate when the steel should be withdrawn from the furnace. At the transformation point there is a marked increase in the rate of temperature

treatment to some prescribed temperature, is the lack of certainty first as to whether all parts of the work are at the temperature indicated by the pyrometer and second, how long have certain parts been at that temperature waiting for the rest to catch up. Also pyrometers go off calibration and steel varies in composition, causing minor fluctuations in the hardening point. These were explained as the major variables, causing lack of uniformity in products hardened by all

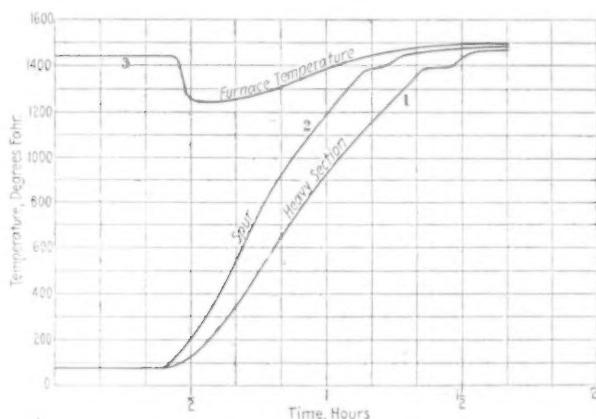


Fig. 1—Temperature Chart of a Steel Piece 4 In. in Diameter with a Spur $\frac{1}{4}$ -In. Thick Placed in a Large Furnace or Lead Bath at 1500 Deg. Fahr. The furnace or bath is but slightly chilled and the spur heats at a rapid rate, passes through the critical temperature and grows to a large grain structure while the large piece is heating more slowly

rise which is made visible to the operator by an auto-graphic recorder connected to a thermocouple placed close to or in contact with the work. The effect is shown by a bend or hump in the curve.

The speaker discussed the principles involved, the type of equipment required and explained the advantages of the process. It was emphasized that this treatment may be carried out under conditions in which the workman may be just as cool, clean and comfortable as he would be in any other department of the factory. The quality of the product, it was further explained, will in a large measure depend upon the intelligence of the man or men responsible for specifications for the treatment. "The product will be uniformly bad, uniformly mediocre or uniformly excellent," Mr. Tall said, "depending upon the treatment selected, but whatever else it is or is not, it will be uniform in quality." Probably the most important causes of non-uniformity, Mr. Tall said, in all methods involving

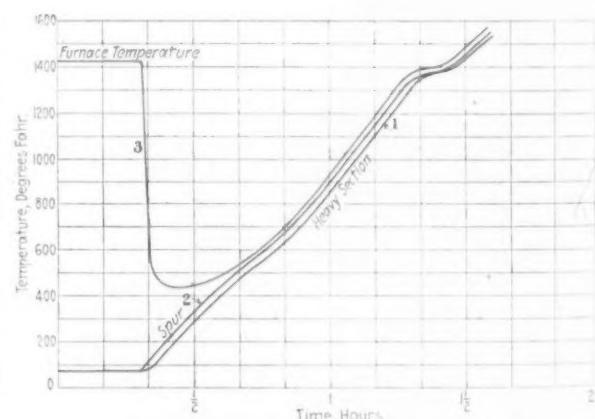


Fig. 2—Steel Piece with Spur of the Same Dimensions as for Fig. 1, Heated by the Hump Process in An Electric Furnace with Small Heat Capacity and with Energy Input Under Instant Control. The furnace, spur and heavy section heat at the same rate and the parts go through the transformation temperature at the same time, thus reducing strains

methods involving treatment to a certain temperature but which are eliminated when working from the "hump."

With his heat treatment practically free from unknown variables and with the known variables under the operator's control, the speaker said, he can vary each until the product is to his liking, and having done so he can describe what has been done so clearly that any workman can carry out the routine and secure just as good results. Further, the use made of the recorder is such that it gives indisputable evidence as to the faithfulness with which the instructions are carried out.

Relative to variables mentioned as being "controlled" it was explained that as far as heating for hardness is concerned there are only two of these. First, the relation of the quenching point to the hump in the curve, and, second, the rate of heating. The first is primarily important as affecting the hardness and toughness of the

product and the latter as affecting warpage, distortion and tendency to fracture, as well as changes in size.

Effects of Different Heating Rates

The effects of different heating rates upon steel when treated were amplified by the speaker. "Consider," he said, "what happens if a chunk of steel say 4 in. in diameter with a spur $\frac{1}{4}$ in. thick is put into a big furnace or lead bath at say 1500 deg. Fahr. From the point of view of temperature what happens is best described by a chart, Fig. 1.

"The furnace or lead pot with its large heat capacity is chilled slightly if at all and remains close to the finishing or quenching temperature. The spur, small in volume, heats at a rapid rate, passes the critical and grows a nice large grain structure while the big chunk is heating more slowly along curve 1. Now steel expands as heated both above and below the transformation point, but contracts while transforming, so in this case from the time the edge of the spur begins to transform until the center of the chunk finishes, there is a continuous condition wherein some parts are contracting while the rest are expanding. Obviously, if no cracks or fractures result there cannot fail to develop a tendency to distortion and the steel goes to the quench with unbalanced strains throughout its body.

"In contrast with this, consider the course of the same piece of steel by the hump process in an electric furnace with small heat capacity and with energy input under instant control. The temperature history would be indicated by a curve as in the chart, Fig. 2. The furnace temperature, curve 3, either as the result of cutting off the current or otherwise, falls to a low point while the work rises from room temperature to meet the furnace temperature, after which the furnace rises steadily in temperature, but at any given time is but slightly hotter than the heavy section which heats along curve 1. Obviously the spur, curve 2, while slightly hotter than the chunk, cannot be hotter than the furnace. Hence by controlling the rate of furnace heating you not only control the rate of heating of the body so as to reach the finishing temperature at a definite time, but you also heat large and small cross-sections at the same rate and all parts go through the transformation temperature at the same time, all parts expanding simultaneously and contracting simultaneously, thereby greatly reducing the strains which go to cause warping and fracture. This, then, is one phase of what is spoken of as control of heating rate, namely, a procedure whereby large and small cross-sections in a piece are made to heat at the same rate.

"But there is another phase of this control of heat rate whose importance though sensed in part is not thoroughly understood. This has to do with the fact that the rate at which a piece is heated is a very important factor governing dimensional changes in the work due to hardening. Some very remarkable results have been obtained in this line where work has been regularly brought through to size and when this is accomplished it is obvious that a high spot in efficiency has been touched, for, on the one hand, grinding, a most expensive process, is eliminated and, on the other, the hardest and best of the steel, the outer layer, is left intact."

Cost of Heating by the Hump Process

Cost of heating by the hump process was next considered by the speaker. "As regards fuel," he said, "a B.t.u. from an electrical source may cost many times as much as one from coal, gas or oil, but you do not have to send 60 to 80 per cent up a chimney or out into a room; you can keep somewhere around 90 per cent of it just where you want it and where it will do your work for you. Furthermore, your electrical B.t.u.'s are much more subject to your exact and instantaneous control than are those from other sources, thus eliminating all loss of time and efficiency due to adjustments preliminary to use. Of course, no elaborate blowing or ventilating system is needed with the electrical system and the cost of operation, maintenance and depreciation of such ought to be charged against any method of treatment involving them."

"As to labor costs, the mode of procedure differs

so markedly in the different methods that it is difficult to make any specific comparison in the body of a brief paper. We can, however, point out that in totaling up the labor costs of heat treatment all labor expended in connection with a gear from the time it leaves the cutting and forming machines to go to heat treatment up to the time it is turned over to stores or assembly as a treated part ready for use, should be charged up to cost of treatment. Do you have to haul your gears three or four hundred yards and down two or three floors to your treatment room and then back again? Do you keep some men busy cleaning off lead

Cost of Heat Treating 200 Transmissions Per 8-Hr. Day by the Hump Process

COST OF OPERATION		
Total cost of hardening equipment.....		\$13,400
Total cost of drawing equipment.....		5,310
Capacity—		
200 transmissions (gears and shafts) per 8-hr. day.		
Power consumption—		
Hardening furnaces.....	4 kw.-hr. each	
Drawing furnaces	7.5 kw.-hr. each	
Assumptions—		
Cost of electrical energy.....		\$0.015 kw.-hr.
Labor—		
1—Central station operator at \$1.00 per hr.		
2—Furnace operators, each at 0.60 per hr.		
1—Drawing furnace operator at 0.60 per hr.		
Heating units—		
	Cost of	
Hardening furnaces.....	Average Life 2,500 hr.	Replacements \$76.00
Drawing furnaces.....	5,000 hr.	120.00
Depreciation—		
20 per cent per year of 300 days.		
Cost of recorder paper—\$0.06 per day per furnace.		
	HARDENING OPERATION	
Cost of power—80 kw. x \$0.015 per kw.-hr. x 8 hr. =		\$9.60
Cost of labor.....	2.20 per hr. x 8 hr. =	17.60
Cost of heater replacements.....	\$1,400.00 x 8 hr. =	4.48
	2,500 hr.	
Cost of depreciation.....	\$13,400 x 20 per cent =	8.81
	300 days	
Cost of recorder paper.....	\$0.06 x 20 =	1.20
	Total hardening operation cost per 8 hr.	\$41.69
	DRAWING OPERATION	
Cost of power....45 kw. x \$0.015 per kw. x 8 hr. =		\$5.40
Cost of labor.....	0.60 per hr. x 8 hr. =	4.80
Cost of heater replacements.....	\$720.00 x 8 hr. =	1.15
	5,000 hr.	
Cost of depreciation.....	\$5,310 x 20 per cent =	3.54
	300 days	
Cost of recorder paper.....	\$0.06 x 6 =	0.36
	Total drawing operating cost per 8 hr.	\$15.25
Unit costs—		
Cost of hardening per transmission.....		\$41.69 = \$0.21
200		
Cost of drawing per transmission.....		15.25 = 0.08
200		

or scale, or straightening warped pieces, or grinding down work to bring it within the tolerance? All such labor is just as much a part of the labor cost of heat treatment as the labor cost of putting work into the furnace and taking it out again. The hump process treats the gears right in the line of manufacture, no cleaning is required, and straightening and grinding if not eliminated are reduced to an enviable minimum. The direct labor costs are the wages of two men who make up a team in handling the process, one a laborer at the furnaces and the other of the grade of intelligence usually associated with a subforemanship. These two men with a well arranged equipment made up of the proper number of the proper size furnaces for the work in hand can turn out from 2000 to 2400 lb. of treated metal per 8-hr. day.

"The maintenance of the standard hump treatment equipment is just about limited to the heating units. They are regularly showing a life of 2500 hr. which corresponds to 311 8-hr. days, practically speaking, a year's life."

The equipment necessary for the heat treatment of 200 sets of average passenger automobile transmissions per 8-hr. day, Mr. Tall said, would consist of approximately 20 hump treatment furnaces and recorders and six drawing furnaces and recorder controllers. The total floor space necessary for this equipment would be approximately 800 sq. ft., or a space 40 by 20 ft.

The total cost of operation of such an equipment was stated to be as given in the accompanying table.

The Production of Good Iron Castings—II*

The Melting Process—Proper Height of the Bed—Effects of Improper Melting—General Principles of Gating

BY DR. RICHARD MOLDENKE

IN the melting processes, the cupola furnace, as the easiest and cheapest method, comes in for most attention. It is the apparatus universally used for converting exactly proportioned mixtures of pig and scrap into highly super-heated molten iron for pouring off molds. In lesser measure the air furnace is made use of in the foundry; the open-hearth furnace rarely. The crucible furnace is obsolete in the iron foundry, and the electric furnace is just getting a foothold at the present time, being ideal for particularly high quality, low sulphur castings for special service conditions.

There are two places in the foundry where particularly competent men should be placed. One is on the cupola charging platform, and the other in the sorting room, where the bad work is separated out. As so much depends upon converting the metal charged into the cupola into serviceable molten material, and the slightest deviation from standard practice may result in higher losses, particularly if much machining is done, it is obligatory to provide for conscientious weighing, uniformity in the sequence and distribution of the items making up the charges, blast regulation, etc.

Successful Cupola Melting

The basis of successful cupola melting is unquestionably the height of the fuel bed. This should not only be kept at proper height but should remain level throughout the heat. Only careful spreading of the pig and scrap, with the layer of coke above, will preserve this level; and the height is a function of the metal and fuel proportion, the blast remaining constant. The blast volume is most important, as will be understood from the following: The oxygen of the air blown into the cupola permits the combustion of the coke, thereby evolving the heat necessary to melt the iron. It is essential that this combustion of the fuel be as complete as possible, or the carbon turned into carbon dioxide gas. A pound of carbon of the fuel will thus yield 14,500 heat units. This carbon dioxide gas is, however, able to dissolve incandescent carbon and make another gas called carbon monoxide and, if allowed to do so by having too high a bed, the pound of carbon in question will have only yielded 4400 heat units; the other 10,100 heat units are lost, being locked up in the new gas, which catches fire and burns as it is met by the air drawn in at the charging door. Thus about two-thirds of the available heat of the fuel would be wasted and dissipated in the atmosphere.

Hence the supreme importance of the proper height of bed to get the maximum of carbon dioxide, a minimum of carbon monoxide, corresponding to the point of highest temperature with maximum super-heat of the molten metal produced. A further point is that this position of the bed also means the practically complete utilization and elimination of the oxygen of the blast, thus avoiding the dangers of oxidized metal for pouring the molds.

As the blast passes through the tuyeres it goes inward and upward through the coke bed, oxygen being used up until gone. With a steady stream of air the velocity of the gases formed within the bed will remain constant, and hence it is possible to adjust the bed height to be just right for a given set of cupola conditions. That is, once the proper height is known, it can be kept at that point provided the blast volume is not changed by meddling with the blast gate speed of the blower, and by seeing that the intermediate coke charges just replace the upper part of the bed burned

away. If the blast volume is adjusted properly to the diameter of the cupola inside the lining, the blast pressure will be normal within high and low points incident to the interior conditions at the end and the beginning of a heat. Thus, with a cupola 54 in. diameter inside the lining there should be 10 tons of iron melted an hour. This means that with 30,000 cu. ft. of air drawn in by the blower per ton of iron to melt, 300,000 cu. ft. per hr., or 5000 cu. ft. per min. air must be put into the bed of the cupola. This gives the number of revolutions of the blower per minute. And these revolutions should not be changed from beginning to end of the heat unless serious consequences are wanted.

Forcing the Cupola

Forcing the cupola by blowing in more air means a higher gas velocity in the bed, which must therefore be made higher to get the ideal melting position. The uncertainties within the cupola under such forced conditions are increased tremendously, and too great a chance taken. It is not good practice to force a cupola. Better to lengthen the heat or augment the capacity by increasing the diameter, if possible. On the other hand, by decreasing the blast volume below normal, the velocity of the gases within the bed is reduced, and unless the bed is lowered there is danger of the formation of the previously mentioned carbon monoxide, with loss of efficiency in the melting operation.

Moreover, the tendency of the blast is to hug the lining and leave the center of the charges only partially affected, thus heaping up a cone in the center of the bed and causing irregular melting. The proper thing to do is to run the cupola at full capacity and, if the iron comes too fast, to shut off the blast completely periodically to stop melting long enough to allow disposal of the molten metal. It is necessary to open one of the peep-holes in the tuyeres at least partially to prevent the gases from backing up into the blower, with disastrous consequences when starting to melt again.

Determining the Height of the Bed

An easy practical way of determining the height of the bed is available to the foundryman. He has only to leave the tap-hole open until a stream of molten metal appears and actually runs over the spout. By allowing sufficient molten metal to flow, this being used to heat the ladles, to insure a safely hot tap-hole, this can be bottled up for accumulation of metal for the first tap. The foundryman should count the minutes from "blast on" to "first iron" as it runs over the spout. This should not be less than eight minutes nor more than ten. The drops of metal passing the tuyeres should be seen in about six minutes. The bed charge is adjusted from day to day until these figures are obtained, and the result is the correct bed height which, with properly regulated blast conditions, should be about 24 in. above the top of the tuyeres, of which there should be but one row of proper size.

The next point to watch is that the height of the bed remains normal. As the metal charges melt, the top of the bed is burned away, to be replaced by the next charge of coke. It is evident that if too much of the bed is burned away, the ideal conditions of the gases and temperatures is upset, and the melting operation becomes inefficient and, with too low a bed, actually bad. Probably a drop of 4 in. in the bed while melting a charge of iron is a good average, and hence the intermediate coke charges should be just 4 in. in thickness to make up for this drop. This at once gives the size of the charge in any cupola, namely,

*Second and concluding portion of an address delivered at the convention of the Southern Metal Trades Association at Atlanta, Ga., June 20-21. The first portion was published in THE IRON AGE, July 22.

one that requires the combustion of a 4-in. layer of coke to melt completely. Since under ordinary conditions of charging it takes a pound of coke to melt 10 lb. of iron, a 4-in. layer of coke weighing, say 200 lb., means a metal charge of a ton for that particular cupola.

Mistake of a Double First Charge

The mistake of using a double first charge of metal is easily recognized from what has been stated, for the bed is reduced not 4 in. but 8 in. melting this double charge, and the subsequent coke layer of 4 in. brings the bed back only part of the way. Hence the poor operation of such a cupola which has started off wrong. The taps will be hot and cold alternately, and the castings from metal melted at the end of each charge will be damaged by pinholes and excessive shrinkage. Every case in which the use of a double charge as the first one has given satisfaction will be found on investigation to have been the result of an extra high bed in the first place. An unnecessary chance is taken under the mistaken impression that so big a quantity of coke on the bed should care for an extra big lot of iron at first, whereas the real fact is that proper and safe melting conditions are only to be had in the upper 4 in. of the bed and everything below these is in the nature of a preparation for proper melting conditions. Below the tuyeres the bed is so much filling up of space intended for storage for the molten metal before tapping out.

The melting rate and heat condition of the metal during the run is the best guide to the height of bed after a proper start. Observation of the cutting action in the lining proves it up, as the patching required should be confined to a zone less than a foot wide and not too low down. Adjusting the intermediate coke charges from 10 to 1 to perhaps 9 to 1, or in cases of high steel scrap percentages even 7 to 1, will maintain the proper height of bed throughout the heat.

The order of charging should be steel, pig and heavy sectioned scrap; and finally light scrap. The higher melting point of steel, heat absorption requirement of heavy sections of metal, and distance away from the bed of light pieces in such a charging sequence result in a melting of the whole material together. Charging the steel last means that it melts with the pig and scrap of the charge above. By spreading each of the materials evenly over the cupola cross-sections melting will be uniform. One of the worst methods of charging often seen is the placing of the pig iron around the rim of a charge, with the light scrap in the middle. The melting ratio at the rim may be 16 to 1 and that in the middle 5 to 1, this can only mean burnt iron at the rim mixing with good metal in the center as it all comes through the tap-hole, and defective work heaped up in the scrap pile.

Slagging-off should be resorted to in longer heats when this becomes necessary, usually, in ordinary practice, after the heat is on for three-quarters of an hour. The limestone should be as nearly pure carbonate of lime as may be obtainable, and seldom more than 1 per cent is necessary with reasonably clean metal. In general, the problem of cupola melting is an extremely simple one, once the underlying principles are understood. A bed of proper height, small charges evenly distributed, and a blast of uniform volume sums up the whole situation. How easy, and yet how rarely carried through to the dot!

Effects of Improper Melting

Now for the bad effects of improper melting practice. Too high a bed means that the cupola is running partially as a gas producer. The iron is melted too high up, where the bed is no longer at maximum incandescence. The result is that the individual drops of metal are not given sufficient super-heat where they form, and do not acquire it in passing through the hottest portion of the bed below. There is no time for this. While, therefore, the iron may be very good so far as quality is concerned, it is too cold for regular work. Too low a bed, on the other hand, means equally cold iron, for it has been melted below the point of maximum temperature of the bed. There has been, however, an exposure to free oxygen still in the blast,

and the consequence is a dissolved iron oxide which raises the freezing point to such an extent that this iron cannot be held in the ladle for any length of time. It has no life, as the foundryman designates the condition, and must be poured quickly. When an iron such as this is poured into the mold it sets too fast for proper feeding, the gates are cut off too quickly, and the result is serious internal shrinkage. More than this, the quantity of dissolved gases is great, and a reaction between any oxygen present with the carbon, which may still go on while the molten metal sets in the mold, results in gas bubbles, which rise under the cope, are caught by the skin of metal already formed, and reveal themselves very disagreeably when the castings are machined. Besides this, there are the undue casting strains, cracks, cold-shuts and other troubles.

The old foundry remedy of dividing the metal and coke charges, usually resorted to when things get desperately bad, is an instinctive feeling that all is not well with the fuel bed. Indeed, the cutting in half of the distance the bed may go up and down during the melting by using half the charges is exactly in line with the scientific correction of the trouble. It is the heavy fluctuation of the height of the bed that accounts for the fact that good and bad castings are made from the same charges, the molding conditions being right. The last portion of every charge, if too large, gets down too low and the resulting molten metal is damaged correspondingly by contact with free oxygen. The poor opportunities for mixing the molten metal in the cupola have been dwelt upon, also that of metal in the ladle. Where very heavy charges are used this bad condition is intensified, and not only good and bad iron may alternate in the ladle, but actually hot and cold.

Importance of Proper Sorting

Reference has been made to the importance of the man in charge of the sorting room. He should not only be competent to inspect the work carefully, but should be able to judge the cause of the trouble. Further, he must be in constant touch with the machine shop, to see how the castings finish up. All lost work should be carefully classified on the records, so as to include losses from poor molding, bad sand, cores, poor iron, hasty pouring, etc. Then each foreman will know what he is up against and is expected to correct. There is no reason why cores should "blow" more than once in repeat work. Sand difficulties, as also pinhole troubles, are not so easily overcome, as it is impossible to regenerate a sand-heap overnight, or to correct the quality of the iron where the returns go into the mixture regularly. Such troubles come slowly and go away slowly. It is up to the foundryman to prevent them from reaching an acute stage at any time. Since the reputation of a foundry rests in great measure upon what passes out of the sorting room, the suggestion of putting a good man there is obvious.

Gating the Molds

The final point on the subject of gating the molds is not so easy to discuss as it would seem. Some fundamental facts must first be brought out in order to understand what goes on within a mold while and after pouring. The terms "shrinkage" and "contraction" must be better defined. The structural condition within castings which have not been fed up properly is called "interior shrinkage." The reduction in length or other dimension incident to a casting from the time it has set to ordinary temperature, erroneously called "shrinkage," is really the "contraction." Shrinkage is more familiar to the foundryman working with low silicon irons, and he fears this phenomenon perhaps more than any other. The broken casting shows porous spots or actual cavities which are lined with a pine-tree crystallization. This is always located in the heavier sections, and where simply unavoidable ordinarily must be overcome by the use of "chills." The serious situation is that it is impossible to detect the trouble by even close inspection of the casting, the uncomfortable truth appearing only when failure has resulted in service. The possibility of interior shrinkage is intimately tied up with the gating up of the mold, and

hence should receive most careful study and, if possible, practical trial where the quantity ordered warrants it.

A given number of pounds of iron occupies a larger volume in the molten state than in the solid. The volume of liquid gray iron may be 5 per cent larger and liquid white iron over 10 per cent larger than these irons if allowed to contract solid. Since, after pouring, the mold filled completely with molten metal remains completely filled with solidified iron, the process operating successively from the surface inward, the reduction in volume can only result in a considerable void in the casting where the metal remained liquid last, unless provision is made to introduce more molten iron into that spot. It is part of the art of the foundryman to do this very thing.

The conditions favoring the feeding of the castings are the following: The use of "risers" or reservoirs taking up the overflow of metal through the top of the mold at given points, from which molten metal can be sucked back into the mold as the casting needs it. The fact that the comparatively narrow gates used for the entrance of the iron from the ladle have so much superheated metal passing through them that they become intensely hot is the reason why they allow molten metal to pass by when the same section in the casting would have set long ago. The placing of the gate at such a point, or at several points, so that the metal has to travel but a short distance before becoming stationary and setting, prevents excessive cooling at dangerous points and allows feeding to go on better. Then, also, the placing of a gate such that no liquid metal is trapped by the setting of thinner sections about it cuts off the supply of liquid metal prematurely.

The General Principle in Gating

In general, the principle is that the molten iron should travel to the end of its run and stay there to set, feeding itself from points nearer the gate little by little, until fully set right up to the gate. If no liquid metal has been left entrapped, the casting will be reasonably sound. The designer of the work should, therefore, be in constant consultation with the foundryman so that between the two a construction may eventuate which will allow good feeding of the thicker portions, either through the gate or by filling the risers with fresh metal and "pumping" as long as may be possible.

Foundrymen, as a rule, give too little attention to the gating problem, and only take it up seriously when threatened with continued or heavy losses. The foreman sometimes tells the molder where to cut the gate, but more often it is left to the latter's discretion. As care is always taken to put the faces to be machined in the drag, the chance is taken that imperfect feeding may not be discovered. For quality work it is advisable to make a few castings from the pattern, break up the pieces and study the fractures for open grained points, shrinkages, measurements and any other features that may be important. The pattern can then be corrected if necessary and the molding details settled upon. With good metal, well melted, and poured into molds the gating of which gives it free scope to set satisfactorily, the percentage of lost castings should be held to a minimum.

There are many minor points in the production of castings which should be well considered by the foundryman. The three main features, discussed in what has been given, form the principal items to be most carefully watched. When thoroughly valued and understood by the foundryman, and the details conscientiously followed out, his clients will remain satisfied and he will know himself to be in the front rank of the castings industry.

Engineering professors from 14 colleges and 13 states are attending the summer course for engineering teachers which is being given by the educational department of the Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa. This course provides practical experience in manufacturing, while lectures are given by heads of the various departments of the company, thus offering a combination of the theoretical and the practical.

FORD PLANS PROGRESS

Development on the River Rouge—Iron Mines to Be Acquired

DETROIT, Aug. 2.—Henry Ford is rapidly approaching realization of his dream of starting with iron ore itself as the basic raw material for his River Rouge automobile, truck and tractor factories. The plants now under construction in the Detroit suburb will take in ore from the Ford mines that are to be developed in the Northern ranges and thereafter all or nearly all of the processes will be carried on within the River Rouge plants.

The Ford plan involves the construction of ore docks, handling equipment, blast furnaces, coke plant, foundries, machine shops, steel works and the motor car plants themselves.

Dredging work is being pushed in earnest in the River Rouge, and the small stream, little more than a creek, soon will be made into a canal large enough to permit the largest ore carriers to reach the Ford plants. A slip has already been built, 250 ft. wide, 2,614 ft. long and 25 ft. deep. At the junction of the slip and the River Rouge a turning basin large enough for the big Lake carriers has been completed.

The first of four large blast furnaces is in blast. Coke ovens, a gas plant, a chemical plant and the conversion of the big Eagle boat plant into a body plant are virtually completed. The second blast furnace will soon be in operation. Engineers say it will be about two years before the entire development is completed and in operation. The ore docks and the slip were completed some time ago. The coke ovens and the by-products plant were placed in production late in 1919.

The site of the development covers nearly 1,000 acres, and while the plants now completed or under construction extend over a stretch of a mile or more, space has been reserved for four more blast furnaces and a second foundry of the same dimensions as the first.

The plans laid out by Mr. Ford for pouring hot metal from the furnaces direct into the molds, eliminating the remelting of iron pigs in the foundry cupolas will be adhered to in part, at least. The cupolas have not been eliminated entirely, however, as the metal from cupolas and furnaces will be mixed.

To insure a steady supply of coal for the River Rouge factories, the Ford interests have contracted for the entire output of three mines in Ohio and have purchased the Detroit, Toledo & Ironton Railroad. To guarantee the source of Ford iron ore, the public and business in general, is expecting official announcement that the Ford interests have leased or purchased outright iron mines in the North and have taken over enough ships to carry the required ore down to Detroit.

Provision of Merchant Marine Act Suspended

WASHINGTON, Aug. 3.—Upon the recommendation of the Shipping Board, the Interstate Commerce Commission has suspended until Jan. 1 the operation of the provisions of Section 28 of the new merchant marine act. This is the section which provides that export and import rail rates may apply only to commodities brought in or designed for shipment in American vessels. Foreign shipping companies, notably the Japanese, have protested vigorously against this provision because of its far-reaching nature. The further suspension of the act has been urged upon the Shipping Board by commercial organizations of the Pacific coast. Suspension for an additional period, it is claimed, will give an opportunity for a complete study of the situation, and preparation to meet conditions which its application will bring about.

The Interstate Commerce Commission immediately following the passage of the act suspended the operation of the section until the middle of September. With the approaching termination of the 90-day period, the commercial organizations have urged the further suspension, which has been ordered.

Design of Open Hearth Furnaces*

Waste Heat Boiler Installations—Calculations Involved and Questions of Setting and Draft—Records of Tests

BY A. D. WILLIAMS

In any regenerative fired furnace it is impossible to reduce the temperature of the waste gases leaving the regenerator to the temperatures of the incoming air and gas. This results in a considerable loss of heat up the chimney. Frequently one-third of the heat passes uselessly up the stack, and the amount of heat lost is more often in excess of this value than it is less.

The theoretical temperature of the waste gases at the base of the stack is about 300 deg. The actual temperature at the base of the stack ranges from 600 to 1000 deg., and rarely runs below 700 deg. This would seem an ideal opportunity to install a steam boiler and recover a portion of the heat, but until, comparatively, a few years ago such an installation was not considered, although the installation of boilers on puddling furnaces had been common practice for many years. To-day few open hearth furnaces are built without waste heat boiler equipment and it is extremely probable that such boilers could be profitably installed in connection with many of the other furnaces.

Considerable notice has been taken of these waste heat installations in the various technical papers, but it has been in the main part simply tabulations of the installations as made with very little real information as to the underlying reasons which led to the selection of the particular equipment installed. A noticeable departure from this practice was presented by the paper of Thomas B. Mackenzie before the Iron and Steel Institute, in 1918.

Provision for Explosions

One of the operating difficulties with the open hearth furnace lies in the fact that explosions of gas are likely to occur whenever the furnace is reversed. This difficulty is also met in all regenerative furnaces. These explosions vary in their intensity from slight puffs to heavy explosions and are due to the gas trapped in the gas regenerator meeting the air that is drawn into the stack flue. When the furnace is connected directly with the stack the puff of the explosion passes up the chimney and is rarely noticed. Similar explosions are not infrequent in blast furnace practice, and experience in that line has demonstrated the absolute necessity of providing explosion doors to relieve explosion pressures, as well as the necessity of making all the flues and settings gas tight and building them with buck stays of sufficient strength to stand the explosion stresses.

When boilers or economizers are connected with the furnace these explosions become of serious import and unless relief valves are provided of sufficient area to prevent excessive rises in pressure the settings will be damaged and numerous cracks will admit cold air, greatly reducing the efficiency of the waste heat installation.

Another cause of unsatisfactory results with waste heat boilers arises from the loss of sensible heat by the gases in passing through the flues. These flues are generally underground and close to the surface,

and the ground above the flue is frequently so hot that it remains dry, except when very heavy rains occur. Exactly what the heat loss from this source will be depends upon the construction of the flue, the depth below the surface and the length of the flue. With waste heat utilization it is desirable that the flues should be well insulated and as short and direct as possible.

The waste gas flues are frequently far from tight, and when waste heat boilers are installed the air leakage into the flues is much more serious than when they connect directly to the stack. Low temperatures at the bottom of the chimney in most metallurgical high temperature furnaces should be viewed with suspicion, until checked by an analysis of the waste gases.

Leakage Through Valves and Dampers

Leaky valves and dampers are another source of trouble when waste heat boilers are installed. The simple butterfly valve is the oldest form of reversing valve. When carefully made and new these valves are tight, but they do not remain in that condition very long when exposed to hot gases. In modern practice the butterfly valve is rarely used, except for reversing the air, the gas being reversed by valves better designed for the prevention of leakage.

There are a number of valves on the market which have proved more or less successful in operation. Many of these valves have water seals, which prevent leakage as long as the water supply is maintained and the pressure differential between the flues or the flue and the air is less than the seal. All water seal valves lose their seal during the reversal period, and while this period, when the sealing lip is lifted above the water surface, may be only a fraction of a minute, a certain amount of loss occurs which cannot be prevented. All water seal valves add perceptibly to the moisture in the hot gases which pass through them.

Fig. 31 shows an arrangement of valves and flues which has been used in the United States. It is rather costly, involving the installation and upkeep of eight valves and two dampers. A method of reversal which experience has shown to be satisfactory with this valve system is as follows: Assuming that the air and gas are entering the furnace through the checkers *K* and *L* and passing out through the checkers *I* and *J*, the sequence of operation is:

1. Steam is cut off from the producers;
2. Air stack valve *F* is closed;
3. Gas inlet valve *A* is closed;
4. Air inlet valve *C* is closed;
5. Gas stack valve *B* is opened. (This passes the gas trapped in the gas checker *K* to the flues and boiler, thence to the stack);
6. Gas stack valve *G* is closed;
7. Air inlet valve *E* is opened. (This admits air to the furnace);
8. Gas inlet valve *H* is opened;
9. Air stack valve *D* is opened;
10. Steam is turned on to the producers.

The important feature of this system of valve operation is the time interval between the opening of the gas and the air stack valves on the same side of the furnace. This interval must be sufficient to permit the inflammable gases in the gas checker to pass into the flues and to the stack before the air stack valve is opened. In the plant where this system was introduced the number of explosions was reduced from

* Copyrighted, 1919, by A. D. Williams. The article is the last of a series that has appeared in the following issues: Jan. 1, proportions of the hearth; Jan. 8, flow of gases within the furnace; Jan. 29, port and roof design; Feb. 12, March 18, April 29 and May 27, regenerators.

about 40 per day to 4 in 411 reversals in a period of five days.

Several other systems are in use, and in some installations the valves are interconnected in sets which are operated simultaneously. Different arrangements of flues and different valves will require some modification of this system, the essential point being the interval between the opening of the gas stack valve and the air stack valve.

This sequence of valve operation will not eliminate explosions unless the valves and the flues are sufficiently tight to prevent any air entering the system while the gas trapped or pocketed in the checker chamber is passing to the stack.

Faulty Boiler Settings

Probably the most important portion of the waste heat boiler installation is the arrangement of the boiler setting with regard to the manner in which the gases

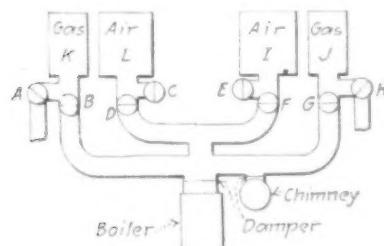


Fig. 31.—An Arrangement of Flues and Valves Used in the United States

pass through it—that is, the baffling and the location of the gas inlet and outlet. The design of boiler settings and their baffling has been the subject of much experimenting, but unfortunately most of these experiments have been made without any very clear conception of the action of the hot gases while flowing past cool metallic surfaces.

The ruling temperature in steam boilers is very low. For this reason it would require designing talent of an extremely high order and much serious study to produce a boiler which would not work. Practically all of the boilers which have been built and installed present extremely gross violations of some of the simplest and most elementary laws of physics, not only in the circulation of the heated gases but in the circulation of the water and steam. Owing to their low ruling temperature these boilers work—that is, they produce steam when hot gases pass through them, but their utilization of the heat is comparatively inefficient when the possibilities of such low temperature applications are considered.

Some three years ago the writer, in the course of a discussion before the Cleveland Engineering Society, stated: "That it seemed to him that commercial boilers were much better designed for the production of soot, a form of lampblack, than they were for the production of steam." Since then he has seen no occasion to reverse his opinion. At the same time he will admit that the low rate of evaporation presents a certain margin of safety in boiler operation—that is, the operating safety of a steam boiler depends upon the maintenance of the supply of feed water. When the water supply fails a very few minutes elapse before the water in the boiler will be evaporated to a point where portions of the heating surface will become dry. This is the danger point, and the higher the rate of evaporation as compared with the volume of water contained in the boiler, the quicker it will pass this danger line.

When the method of baffling steam boilers is examined, it will be found that the hot gases are introduced at the lowest point of the setting, that these gases rise in two of the passes and drop through the middle pass, and are carried away from the highest point of the setting. Experience with regenerators and similar

heat-absorbing structures has shown that this arrangement of gas passages is absolutely illogical. Some waste heat boilers without baffling have been installed in connection with copper smelting furnaces, but in these installations the baffling was removed in order to reduce the resistance to the passage of the gases through the boiler, and the manner in which the gases were introduced and carried away from the setting was not calculated to obtain the best results. The main idea in the design appeared to be that the gases should pass through the boiler setting as rapidly as possible without any consideration of the utilization of their sensible heat, while two boilers were placed in series in order to reduce the temperature of the outgoing gases. The precedent of this design has been followed in other cases.

There is a considerable diversity of opinion in regard to the manner in which waste heat boilers should be rated. In America boilers are usually rated at 10 sq. ft. (0.933 sq. m.) per horse power, which is equivalent to an evaporation of 3 lb. (14.6 kg.) per sq. m. of heating surface. Some have considered that this rating should be reduced to 7.30 kg. for waste heat service, in

Waste Heat Boilers Installed on Open Hearth Furnaces (Thomas B. Mackenzie, Iron and Steel Institute, 1918)

	I.	III.	V.	VII.	IX.
Nominal capacity of furnace, tons	30	45	100	60	60
Heating surface*, sq. m.	151.00	170.00	204.00	204.00	204.00
Economizer heating surface, sq. m.	66.2	89.4	111.9	111.9	111.9
Steam pressure, absolute per sq. cm., kg.	7.14	8.35	5.20	6.18	8.64
Feed water, init. temp..	11.6	6.95	40.8	9.5	29.3
Feed water, final temp..	117.8	120.6	133.5	133.00	129.00
Gas temperatures, deg. C.:					
Entering boiler	504.00	585.00	422.00	577.00	439.00
Leaving boiler	254.00	273.00	232.00	303.00	304.00
Drop in boiler	250.00	212.00	190.00	274.00	135.00
Leaving economizer	169.00	182.00	184.00	172.00	264.00
Drop in economizer	84.00	91.00	48.00	131.00	40.00
Draft in mm. of water:					
At boiler inlet	....	23.00	40.00	25.00	25.00
At boiler outlet	....	62.00	78.00	63.00	95.00
Drop through boiler	....	39.00	38.00	38.00	70.00
At draft fan	20.00	87.00	80.00	76.00	146.00
Drop through economizer	....	25.00	2.00	13.00	51.00
Probable volume of gases passing through boiler per sec., cu. m. at zero and 760 mm.....	9.74	10.35	15.50	15.50	24.60

*Boilers all Babcock & Wilcox type.

Other Waste Heat Boiler Data.

Test number	1 ¹	2	3	4	Lackawanna Steel Co.
Plant	Ill. St. Co.	Indiana St. Co.	Bethlehem Co.	B. & W.	B. & W.
Rated furnace capacity, tons	65	75	80	.....	00.00 ²
Actual furnace capacity, tons	72 ³	85	82.6	.....	00.00
Type of boiler.....	Stirling	Rust	B. & W.	B. & W.	
Boiler heating surface, sq. m.	371.6	453.3	486.0	502.3	
Steam pressure absolute, kg. per sq. cm.....	9.76	9.86	.....	.....
Superheat, deg. C.	71.00	98.00	67.00	54.00	
Gas at boiler inlet.....	664.00	624.00	739.00	530.00	
Gas at boiler outlet.....	327.00	277.00	256.00	242.00	
Draft at boiler inlet mm.....	337.00	347.00	483.00	288.00	
Outlet .....	.....	37.00	39.00	45.00	
Draft loss in boiler	45.2	100.00	83.00	92.5	
Weight of gas passing through boiler, kg. per sec.	9.22	10.60	9.50	10.00	

¹Average of ten tests.

²Approximate.

³Tilting furnace.

Tests Nos. 1, 2 and 3 from C. J. Bacon's paper at 1915 meeting of the American Iron and Steel Institute.

Test No. 4, Arthur D. Pratt, American Society of Mechanical Engineers, Dec., 1916.

spite of the fact that many boilers are in service at rates of evaporation considerably in excess of the above figures. When it comes to the selection of a boiler for any given waste heat installation a consideration of some of the installations which have been made indicates wide differences in regard to the area of heating surface required.

The following method of arriving at the amount of boiler heating surface required for absorbing the waste heat from an open hearth furnace is simply an exten-

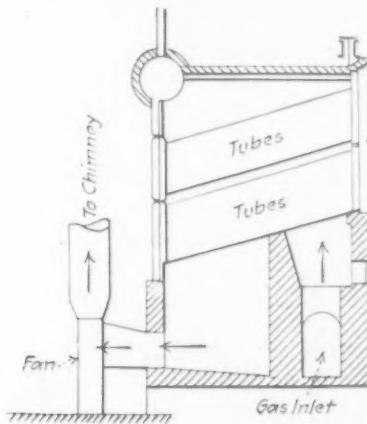
sion of the method used by the author in arriving at the regenerator capacity required and reference must be made to the heat capacity curves given in the preceding section of this work.

	Gas Checker.	Air Checker.
Temp. products of combustion at bottom of checker work, deg. C.....	800	600
Products of combustion per cu. meter of gas burnt, cu. m.	0.90	1.78
Products of combustion = $0.90 + 1.78 =$	2.68	
Average temp. products of combustion $\frac{[800 \times 0.90] + [600 \times 1.78]}{2.68} = 665$		
(No allowance is made for a heat loss in the flues, although in practice a temperature drop of 50 to 100 deg. will occur between the bottom of the checkerwork and the boiler inlet. The heat capacities given by the curves are based on the consumption of 100 molecular volumes or 2.232 cu. m. of gas. These values have been reduced to those for a cubic meter of gas burnt in this computation.)		
Heat capacity products of combustion of 1 cu. m. of gas at the bottom of the checkerwork, average $t = 665$, calories	635	
Heat capacity products of combustion of 1 cu. m. of gas at the boiler outlet, average $t = 200$, calories.....	162	
Heat available for production of steam, calories.....	473	
Assuming that one-third of this heat will be lost in flues and boiler setting, net amount of heat available will be, calories	316	
Heat required for evaporation of 1 kg. of water at 5.54 kg. per sq. cm. absolute (78.76 lb. per sq. in.) = $156 + 500$, calories	656	
Products of combustion from 1 cu. m. of gas will evaporate: $316 \div 656$, kg.....	0.481	
1 sq. m. of boiler heating surface is equivalent to the evaporation of 15 kg. of water per hr.; or 0.00417 kg. of water per sec.		
Area of the heating surface required to evaporate 0.481 kg. of water per sec. will be: $0.481 \div 0.00417$, sq. m.	116	
(This being the area of the heating surface required to absorb the heat in the products of combustion from 1 cu. m. of gas burnt.)		
As the average amount of gas burnt per sec.* is 1.75 cu. m., the area of the heating surface required will be: 116.00×1.75	203	

*Page 1226, THE IRON AGE, April 29, 1920.

In practice it might be desirable to divide this heating surface between an economizer or feed water heating section and a boiler or steam producing sec-

Fig. 32 — Proposed Setting of Marine Type of Waste Heat Boiler



tion. This method of construction will result in a reduction of the size of the boiler and its cost, and possibly may reduce the total cost of the installation. When the cost of the foundations and other structure required to install the economizer is considered it is probable that the total cost will be about the same for both methods of installation.

Another factor that has to be considered is the area of the gas passage through the boiler must be sufficient to permit the maximum volume of the products of combustion to pass without adding unduly to the draft resistance through the boiler.

In the foregoing computation the temperature of the boiler feed water was taken as zero centigrade. In practice this will not be the case, if the average temperature of the water is considered.

The Matter of the Draft

Stationary or land practice has persistently used brick boiler settings in spite of their many disadvantages. Brick settings are undoubtedly less costly than air-tight steel-sheathed boiler settings, and the fact that the weight of the boiler setting on land is unim-

portant has led to the almost exclusive use of the porous brick setting, owing to its lower cost. There are a number of places where the extremely low draft pressure makes the brick setting comparatively unobjectionable, but in open hearth and other waste heat installations where a large draft differential is required the porosity of the brick setting is objectionable. In addition the brick setting will be badly damaged by any explosions which may occur; the brick work is readily cracked and these cracks admit air which will produce explosions at each reversal.

Practically all waste heat boilers installed upon open hearth furnaces have necessitated the installation of an induced draft fan. With the commercial types of boiler set and baffled to the makers drawings, these fans will be necessary, or else an unduly high chimney. The pressure in the heating chamber of the furnace is equal to the atmospheric pressure and it is necessary to supply a draft depression below the regenerators sufficient to remove the products of combustion from the furnace; additional draft depression must be supplied to overcome any friction in the passages through which the waste gases pass. There are limits to the height of chimney which it is desirable to install in connection with an open hearth furnace and any further increase in the draft depression must be secured by the installation of a draft fan. When these fans are operated by steam they will consume about one-fifth of the total steam generated and the balance will be available for the gas producers and for supplying the other power demands of the plant.

The primary function of the open hearth furnace is the production of steel and this should be kept in mind in the design of the waste heat boiler setting and flues. The boiler should be by-passed so that any failure in these portions of the equipment will not necessitate the shut down of the furnace. In some cases steam jet apparatus has been installed to provide against the failure of the fan or its motive power.

The venturi coned ejector form of chimney has been employed in some installations. This type of chimney may be used in either of two methods, the fan may be reduced in size and only handle a portion of the waste gases, or the Louis Prat method may be employed in which the fan handles cold air only. This latter method is analogous to that of the hydraulic head increaser designed by Clemens Herschel for use with low head hydro-plants.

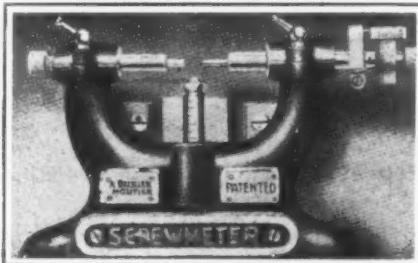
One of the incidental advantages of introducing induced draft in the operation of the furnace arises from the fact that the fan draft may be increased to compensate for the blocking up of the checkers and the operation of the furnace will be entirely independent of those barometric and weather conditions which affect chimney draft.

The Knoxville Iron & Steel Co., Knoxville, Tenn., is preparing to use powdered coal for puddling, busheling and reheating furnaces as well as for boilers to replace its present hand-fired method. Contract has been closed with the Quigley Furnace Specialties Co., 26 Cortlandt Street, New York, for a complete system, including coal milling plant and equipment for distributing and burning the pulverized fuel by the Quigley compressed air system. Work on this installation is to be started immediately.

McFarland Foundry & Machine Co., Trenton, N. J., which recently acquired a new plant, intends to continue in the same line of business at the new location which it conducted at the old. It will not at present build its proposed gray iron foundry or machine shop. During the next year or so, it will confine its activities to the chilled iron wire drawing dies. Its new address is Miller and Willow streets, Trenton, N. J.

Screwmeter for Verifying Screw Threads

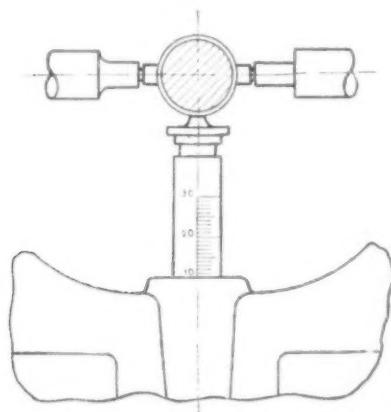
An apparatus, explained as enabling the determination to the hundredth of a millimeter or a quarter thousandth of an inch, not only of the nominal diameter but also of the pitch diameter and the diameter at the root of the screw thread, is manufactured by Andrew Bechler, Moutier, Switzerland, and is being marketed by the Selson Engineering Co., 24 Stone Street, New York. The screwmeter is furnished in two models, a large one for measuring screws from 1 to 80 mm. or about 3/64 in. to 3 1/8 in. in diameter,



Screw Meter for Measuring Screws 1 to 80 mm., or 3/64 in. to 3 1/8 in. in Diameter. A smaller machine measures from 1 to 25 mm., or 3/64 in. to 1 in. in diameter.

a small one, which looks much like a micrometer, for measuring screws from 1 to 25 mm. or 3/64 in. to 1 in. in diameter. The small tool may be used directly on the lathe.

The large screwmeter, shown in the accompanying illustration, has two arms, one of which holds an adjustable stop that can be blocked up instantly in any position. The other arm is supplied with a micrometer screw and a disk graduated to hundredths of a millimeter or 1/4 thousandths of an inch. Prisms for measuring the top and root of the threads are inserted in



One Arm Holds an Adjustable Stop, and the Other Arm Has a Micrometer Screw and a Disk Graduated to Hundredths of a Millimeter or 1/4 Thousandths of an Inch. The Vertical Rest Supports the Piece to be Measured and is Graduated so that the Reading for the Radius of the Piece is Given on a Level with the End of the Rest.

the ends of the two arms. The vertical rest is placed at the center of the frame and is graduated. It is intended to support the piece being measured, approximately in line with the micrometer screw. The graduation of that support is such that the reading for the radius of the piece is given on a level with the end of the rest.

For measuring the screw thread, the thread gage or prototype is placed on the vertical rest, the appropriate prisms for measuring are put into contact with the sides, root and top of the threads of the gage. After the result indicated on the graduated barrel is noted, the gage is replaced by the screw to be inspected. The second measuring, it is explained, will give the difference between the gage and the measuring piece to the hundredth of a millimeter or 1/4 thousandth of an inch. The number engraved on the prisms intended for measuring the sides, gives the pitch to the hundredth

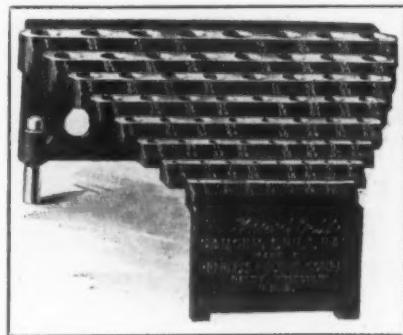
of a millimeter or 1/4 thousandth of an inch. The thread gages are made in all sizes and for all kinds of screw threads.

Gaging Drill Rack

The drill rack and gage shown in the accompanying illustration is a recent product of the Peerless Machine Co., Racine, Wis. The rack provides a practical gage for the drills and reamers ordinarily used in the shop, and also provides the means for keeping each drill in its place with the size visible in raised figures below each drill hole.

The rack may be installed in the tool crib where one rack may be used exclusively as a gage while another series of racks may be used to take care of the different tools. In small shops the racks may be attached to the drill-press, and a complete set of drills maintained at the machine tool. Interchangeable units permit the assembly of a rack to meet individual needs. They may be built in practically any combination as they can be expanded sideways, up and down, or straight out.

The rack holds fractional size drills from 1/16 in. to

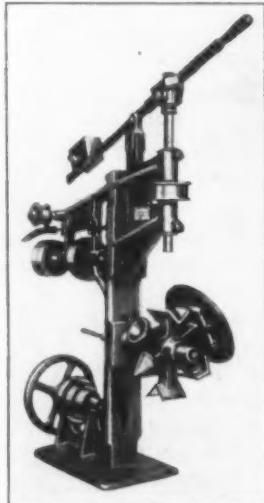


Interchangeable Units Permit the Assembly of the Peerless Drill Rack and Gage to Meet Individual Needs

1 1/4 in. in diameter. Space for three drills of each size is provided ordinarily in sizes 1/16 in. to 1/8 in. inclusive, two drills from 9/64 in. to 5/16 in. inclusive and one drill only above 5/16 in. in diameter.

Bench Drill With Monitor Table

A bench drill with a work rest designed to accommodate work of different shapes, is being manufactured by G. R. Mellon, 933 Communipaw Avenue, Jersey City, N. J. By pulling the table forward, it is disengaged and can be turned to the form desired. The table is then released, as it is self-locking. The forms on the monitor table are for drilling pin holes in shafts, collars, circular parts, balls, angular pieces, etc.



The Rest on the Drill Accommodates Work of Different Shapes

thus to accommodate long or short material, and making it impossible to drill off center in round stock. The flat table shown is 8 in. in diameter and can be readily detached.

The greatest distance from the spindle to the table is 11 in. and the extreme height over all is 40 in. The vertical movement of the spindle is 3 1/4 in. and the drilling capacity, 0 to 5/8 in.

Giving Railroads Financial Assistance

Interstate Commerce Commission Approves Large Loan to Great Northern—National Railway Service Corporation Is Organized as Provided by Congress

WASHINGTON, Aug. 3.—Purchase of 1000 75-ton hopper-bottom steel ore cars by the Great Northern Railway Co. is made possible by a loan approved during the past week by the Interstate Commerce Commission. The commission granted a total loan of \$17,910,000 to the Great Northern. Besides aiding in purchasing steel ore cars the money will be used toward meeting maturing indebtedness of \$20,000,000, and in purchase of 45 heavy standard Mikado locomotives and also in making additions and betterments which will directly promote the movement of freight cars. The road itself will finance \$3,290,000 of the purchase price of the freight train equipment. The total cost of the freight train equipment will be \$5,300,000, and of additions and betterments, \$1,800,000.

Of the total loan, \$15,000,000 will be used for the purpose of enabling the carrier to meet in part its maturing collateral trust notes due Sept. 1, aggregating \$20,000,000.

Must Be Repaid in Year

The outstanding feature of the \$15,000,000 portion of the loan is that it is to be repaid within one year from date or not later than Sept. 1, 1921, when the amount of the repayment will be available by the Government to meet the demands of other carriers for loans before the expiration of the period provided by law for the disbursement of the revolving fund. A further condition is that the carrier is required to pledge itself to apply to the commission for a loan to purchase, or contract to construct, 500 refrigerator cars, one-fourth of the cost of which will be financed by loan from the Government, and three-fourths of which will be financed by the carrier itself.

The commission also approved a loan of \$815,000 to the Central of Georgia Railway Co. to aid in the purchase of 100 stock cars, 500 box cars, 200 gondola cars, and 7 mountain type freight and passenger locomotives. The estimated total cost of this equipment is \$2,785,000, of which the road itself will finance \$1,970,000.

Another loan approved by the commission is that of \$200,000 to the Atlanta, Birmingham and Atlantic Railway Co. to aid the road in meeting a maturity of \$475,000 due July 19. The loan was made with the condition that the carrier finance the remainder of \$275,000 of the maturity for the term of not less than one year at a cost to itself not exceeding 7 per cent.

National Railway Service Corporation

Purchase of new equipment by the railroads will be facilitated as a result of the organization of the National Railway Service Corporation, papers of which were filed in Baltimore by S. Davies Warfield, president of the National Association of Owners of Railroad Securities.

This is the equipment trust whose organization was authorized by an act of Congress and whose financing scheme has met with the approval of the Interstate Commerce Commission.

Under its charter the corporation has authority to carry on the business of constructing, acquiring by purchase or lease, selling and leasing locomotives, cars, rolling stock and other railroad supplies. The corporation is empowered to act as an agency of the Interstate Commerce Commission in the matter of loans for the purchase of equipment, and also to act as an agency of the President of the United States in the discharge of any functions relating to Federal control or the relinquishment or liquidation thereof which may be authorized by the President.

The corporation plans to issue its obligations under two plans. The railroads may purchase equipment outright through the corporation under an equipment trust

providing for 30 semi-annual payments, the trust maturing in 15 years, at which time the equipment becomes the property of the carrier making the purchase.

Commission Will Make 15-Year Loans

The Interstate Commerce Commission will make 15-year loans to the corporation in amounts dependent upon the class of equipment purchased. The railroads, under this plan, are required to furnish an agreed amount of collateral to secure the equipment notes given by the Government, which have a lien on the equipment subordinated to the lien of the equipment notes purchased from the corporation by investing institutions and investors. Under the second plan the corporation will lease equipment to the railroads under the plan of semi-annual payments running 15 years, the carriers charging the rental to operating expenses. By a nominal payment at the expiration of 15 years the railroads that complete their payments will receive the equipment as their own property. In the case of lease, little or no collateral will be required from the railroads. In either case the title to the equipment remains either in the corporate trustee or in the corporation.

Announcement has been made by Mr. Warfield that an issue of equipment notes will soon be made totaling \$30,000,000, maturing in 15 years. About 40 per cent of this fund will be borrowed from the Government at 6 per cent, either direct or through the carriers participating in the series. The remainder will be borrowed from investing institutions at 7 per cent.

Participating Railroads

The railroads which are to participate in this issue are the Baltimore & Ohio to the extent of \$14,000,000; the Rock Island and the Minneapolis & St. Louis Railway to the extent of \$11,000,000, and the Bangor & Aroostook to the extent of \$150,000. A decision has not been reached as to the other roads which will participate. Several roads have made application.

The new corporation is a public corporation, and will operate without profit. The stock issue is nominal and is owned by the National Association of Owners of Railroad Securities and transferred in blank to the Secretary of the Treasury of the United States. Congress will be asked to reincorporate the corporation by Federal Act. Several life insurance companies have tentatively agreed to take certificates of the corporation. The trustees of the corporation besides Mr. Warfield include Haley Fiske, president Metropolitan Life Insurance Co. of New York; John J. Pulley, president Emigrant Industrial Savings Bank, New York; Darwin P. Kingsley, president New York Life Insurance Co., New York; Myron T. Herrick, president Society of Savings, Cleveland, and George E. Brock, president Home Savings Bank, Boston.

Railroads Need 50,000 Open-Top Cars

Mr. Warfield, in discussing the new corporation, said that 50,000 open-top cars are necessary to relieve congestion at the steel mills, coal mines and other industries. He said that the corporation would suggest to large shippers who have surplus funds for investment that they co-operate with the corporation to the extent of purchasing part of a series of equipment notes of the corporation for the purchase of cars designed to meet the demands of their business. The Government, under the proposed plan, will loan to the corporation such amount as the class of equipment justifies, the remainder of the series to be raised one-half from the shippers and one-half from investors.

The Interstate Commerce Commission held a hearing during the past week on the question of interest rates on funds for railroad financing obtained from

private sources. The commission has approved loans from the Government revolving fund with a proviso that the roads shall obtain additional capital from private sources at rates of interest not exceeding 7 per cent. A number of railroad officials and bankers appeared before the commission to protest against this limitation. Some of them took the view that the com-

mission should make the maximum 7½ or 8 per cent in view of the market conditions, while Theodore Prince, a New York banker, declared that the commission should make no attempt to regulate interest rates. It was the opinion of most of the witnesses that railroads will have great difficulty in financing their needs unless they pay more than 7 per cent. O. F. S.

Technology of Sheet-Metal Enameling

WASHINGTON, Aug. 3.—The Bureau of Standards is issuing a general treatise dealing with the technology of enameling sheet iron and steel. It has been compiled by J. B. Shaw in response to the demand for a general treatise dealing with the technology of the manufacture of vitreous enamels for these metals.

From the standpoint of mechanical equipment, says the booklet, the sheet-iron and enameling industry has been, probably, the most progressive of all ceramic industries in the United States. The presses and machinery used for working the steel and forming the shapes are unsurpassed in ingenuity by those used in any other industry, and are constantly being improved. In this respect the sheet-metal enameling industry of this country has led the world. In the strictly ceramic lines of the industry having to do with the preparation and application of the enamel's progress has been less rapid. Up to a few years ago there was very little work carried on, and this little was seldom published. Recently there has been a decided change in this respect. Representatives of the enameling industry have been joining the ceramic technical societies, have been contributing rather liberally to the journals of these organizations and have been showing a decided interest in developing the technology of sheet-metal enameling. The leading manufacturers of the country are realizing that the sheet-iron enameling industry has reached the limit of development possible so long as it depends upon formulas rather than upon men with technical training which will enable them to improve and manipulate these formulas to meet the varying conditions.

"In collecting the data for this paper," declares the announcement of the Bureau of Standards, "an effort has been made to obtain reliable and authentic information wherever available and correlate it in such a manner as to shed some light on the problems encountered by enamelters. The treatise is a compilation of data dealing with the subject of enameling from various publications, from the note book of the author, from the files of the Bureau, and from the experience of men engaged in the enameling industry in this country.

"Among the subjects dealt with in connection with the properties and preparation of steel for enameling are physical and chemical requirements, sand blasting treatment preliminary to pickling and methods of pickling. A chapter is devoted to the properties of the raw materials used in compounding enamels. The relations between chemical composition and physical properties of enamels are discussed fully. The procedure used in the preparation, applying and firing enamels are described in detail. The calculation of enamel formulas is fully explained and examples are given. The physical properties of enamels are dealt with in some detail and resistance of enamels to chemical action is fully discussed."

The Copper Industry in 1919

The smelter output in 1919, according to H. A. C. Jenison, of the U. S. Geological Survey, was about 1,310,972,000 lb., a decrease of 597,561,000 lb. from that of 1918. The production of refined primary and secondary copper from domestic and foreign ore and metal was 1,863,580,000 lb., which was 612,497,000 lb. less than the production in 1918. Refined primary copper amounting to 326,043,000 lb. was produced from ore or other material imported from foreign countries, principally Chile, Peru, Mexico, and Canada.

The discrepancy between the smelter production and the refinery production is due to the fact that

562,000,000 lb. of blister copper and other material was in process of refining at smelters and refineries or in transit on Jan. 1, 1919, and though it was smelted in 1918 it was not refined until 1919.

In 1919 the imports of copper in all forms amounted to 429,388,000 lb. and the exports of copper in all forms amounted to 516,628,000 lb., which was 231,062,000 lb. less than the exports in 1918 and 616,205,000 lb. less than those in 1917. The exports in 1919 were less than in any year since 1907.

On Jan. 1, 1919, the stocks of refined copper were 180,000,000 lb., and on Jan. 1, 1920, they were 631,000,000 lb., an increase during 1919 of about 451,000,000 lb. The stocks on Jan. 1, 1920, were several times greater than they have ever been before.

In addition to the stocks of refined copper in hand about 310,000,000 lb. of blister copper and material was in process of refining at smelters and refineries or in transit on Jan. 1, 1920. This estimate does not include blister in foreign smelters destined for the United States for refining nor material in transit to the United States from such smelters.

The apparent domestic consumption in 1919 was about 876,564,000 lb., which is 785,106,000 lb. less than that in 1918 and less than the domestic consumption in any year since 1914.

Many causes contributed to decrease the smelter and refinery production, the domestic consumption, and the exports, and to increase the stocks, but the principal one was a poor market. The industry was working at maximum capacity when the war demand for copper ceased, and it was then, of course, forced to continue production only at the rate required to supply the ordinary commercial and industrial demand. On the whole, the year was an unsuccessful one, and in view of the conditions it is remarkable that the industry remained as stable as it did.

Propaganda for Metric System

WASHINGTON, Aug. 3.—A Washington newspaper has published several articles that indicate an active resumption of propaganda for the metric system. The basis for these articles is the allegation that "more than 100,000 petitions in favor of the system" have been "recently" received at the White House. No such aggregate of petitions, nor anything like it, has arrived at the Executive offices, say attaches of the White House. As the result, it is concluded here that this is merely a press agent program to arouse interest in the metric system.

There is not the slightest chance of a real effort being made at the December session of Congress to touch legislation concerning the metric system. The session which will convene Dec. 6 will have its hands so full with genuine National legislation that there will not be a moment to spare for the metric system propaganda. As the 66th Congress expires by Constitutional limitation on March 4, 1921, the three short months of the winter session will be devoted exclusively to appropriation bills and to such measures touching upon foreign and domestic affairs as cannot be postponed.

The Canton Pneumatic Tool Co., Canton, Ohio, was recently incorporated under the laws of Ohio and has purchased the business of the Pittsburgh Pneumatic Co. The new company will operate under the same management as the old, but has secured a larger and more suitable factory for its operations and in the near future will materially increase its output. Future invoices should be made out in the name of the Canton Pneumatic Tool Co.

Number of Immigrants Increases

Many Reservists Who Fought in the Great War Returning to This Country — Movement to Foreign Lands Is Decreasing

THE gradually mounting figures of immigration issued by the Bureau of Immigration at Washington and by the Commissioner of Immigration at the port of New York, through which the greatest number of immigrants pass into the United States, show prospects of some relief in the labor shortage. So greatly has the number of foreign arrivals increased within the past few months that Commissioner Frederick A. Wallis at Ellis Island recently notified the Bureau of Immigration, Department of Labor, Washington, that improved facilities for handling the influx were necessary, present arrangements being entirely inadequate. Although Ellis Island to-day presents a decidedly different aspect from the Ellis Island of a year ago, Superintendent of Immigration Baker pointed out to a representative of THE IRON AGE that a large proportion of the increase since last March consists of reservists who answered the mobilization calls of their respective countries in 1914, 1915 and 1916, and are now returning in many instances with wives, children and other relatives, who represent a large percentage of the newcomers.

Aboard the "Ellis Island," the ferry that carries the immigrants from quarantine on the last leg of their journey to America, is generally a soldier of the United States Army recruiting service, well supplied with circulars in various languages. A common occurrence is for him to be greeted by a volley of broken English announcing that the speaker has had enough of armies during the past four or five years, and is going to work at a good job.

In June of this year the estimated number of admittances at Ellis Island alone, according to Superintendent Baker, was more than 44,000, while the estimated total from July 1 to July 24 is more than 11,000. A report made by the Inter-Racial Council, New York, which has compiled available statistics for 1919 and 1920, shows that during the first five months of 1920 the preliminary figures for the port of New York, which usually handles about 80 per cent of the total immigration and emigration for the country, show a net increase of 38,288, as follows:

Month	Admitted	Departed	Increase	Decrease
January	25,051	24,529	522	
February	22,086	24,379		2,293
March	29,098	18,714	10,384	
April	36,958	26,169	10,789	
May	40,048	21,162	18,886	
	153,241	114,953	40,581	2,293

A comparative analysis of these figures cannot be made, however, as the racial classifications of those admitted and departed are not available. It appears that practically all of those who left the United States during these five months were able-bodied male wage earners. Of those who entered, about half were women and children, and a large part of the rest were natives of Italy and returning reservists. Many of the men admitted had previously been in the United States and practically all of them had definite destinations and knew exactly where they wanted to go. Comparatively few new able-bodied aliens are arriving, as a number of the European countries do not yet permit men of military age to leave their borders. Our own wartime passport regulations requiring an American Consul's visé before an alien is allowed to board a vessel, the enforcement of the illiteracy test, and the fact that many of the large passenger steamers formerly bringing in immigrants are now out of commission, will temporarily retard a return to the pre-war immigration to the United States.

During the six months from July 1, 1919, to Dec. 31, 1919, the total number admitted was 162,883, and departed 166,212—a net loss of 3329. In the same six

months of 1913 (the last year of our normal immigration), the total number admitted was 734,869, and departed 153,790—a net gain of 581,079. An analysis of these figures by races indicates that in 1913 there was an increase in 39 of the 40 races listed. In 1919, however, 12 of the races that normally provide the bulk of our unskilled labor supply, including Serbians, Greeks, Italians and Roumanians, show a total decrease of 86,102, and six other races that also usually furnish large numbers of unskilled immigrant workers, including Russians, Ruthenians, Bohemians and Lithuanians, show a total increase of only 2159. The 18 races that during this period show an increase of 64,443, including the English, French and Scotch, do not generally engage in the basic agricultural or industrial work of the country. The Mexicans also show an increase of nearly 18,000, but they were generally admitted under bond (as illiterates) to meet the agricultural needs of border states.

Heavy Increase in Immigration

WASHINGTON, Aug. 2.—Incomplete figures indicate that immigrant aliens admitted into the United States during the fiscal year ended June 30 totaled more than 400,000. This total is greater than in any year since the fiscal year ended June 30, 1914, when the war interrupted the flow of immigration.

For a time last fall monthly figures showed the departure of more alien emigrants than the number of alien immigrants admitted to this country, indicating the return of many of the foreign peoples to their native countries following the conclusion of the war. During the past winter and spring, however, the incoming totals have been steadily increasing, the latest figures showing about twice as many alien immigrants admitted as the number departing.

Lack of shipping accommodations and continuance of war time passport restrictions still restrict somewhat the immigration into this country. Outside of the war time restriction requiring aliens to have passports visé by American consuls, there is no bar to the admission of aliens from countries other than the enemy nations. As shipping accommodations increase the immigration totals are expected to mount rapidly until the totals approach those of pre-war years. There is a possibility, however, that Congress might at any time put up the bars against the admission of immigrants as urged by organized labor. The labor leaders urged Congress in the last session to prohibit immigration for a period of from one to four years, but Congress failed to enact such legislation.

The immigration during the fiscal year just ended while considerably in excess of that of the war years, yet is far below the pre-war totals. In the fiscal year ended June 30, 1914, the number of alien immigrants admitted was 1,218,480. The previous year the total had been 1,197,892. The highest mark on record was in the fiscal year ended June 30, 1907, when the total reached 1,285,349.

Following the outbreak of the European war, the total for the fiscal year ended June 30, 1915, dropped to 326,700; June 30, 1916, to 298,826, and June 30, 1917, to 295,403. A further slump was shown after the United States entered the war, the total for the fiscal year ended June 30, 1918, being 110,618, and for June 30, 1919, 141,132.

Latest Complete Statistics

The latest official complete figures are for the month of March. In that month immigrant aliens admitted totaled 39,971, while 22,639 departed. Officials of the Bureau of Immigration have estimated that the total number of aliens admitted to the United States in April

was 69,500, and in May, 70,100. Deducting from these two figures the non-immigrant aliens, it is estimated that immigrant aliens admitted totaled between 45,000 and 50,000 in each of these months. The total for June is believed to be fully as large if not larger. On the basis of an estimate of an average of 45,000 for each of the three months of April, May and June, the total of immigrant aliens admitted for the nine months of the fiscal year, up to and including March, 265,318, would be swelled to slightly more than 400,000 for the complete fiscal year.

Since October, 1919, the number of immigrant aliens has been greater each month than the number of emigrant aliens. This does not mean that the number of departures for other countries has fallen off materially, but that the immigration total has been steadily increasing. The flow of aliens from the United States began early in 1919, soon after the armistice was signed, and has been going on continuously since that time. The total emigrant aliens who left this country for the nine months of the fiscal year to March, 1920, were 227,544 as against the total number of immigrants for the same months amounting to 265,318.

Occupations and Destinations

Total figures showing occupations and destinations of immigrant aliens are available only for the period up to Dec. 31, 1919.

During the six months ended Dec. 31, 1919, the immigrant aliens totaled 162,883 as against emigrant aliens totaling 166,212. Of this number 643 iron and steel workers came into this country as against 103 departing. The machinists admitted totaled 1554 as against 524 departing; mechanics admitted totaled 1015 as against 318 departing. Metal workers other than iron, steel and tin admitted totaled 148 as against 68 departing. Blacksmiths admitted totaled 287 as against 137 departing. Locomotive, marine and stationary engineers admitted totaled 813 as against 194 departing. Miners admitted totaled 1186 as against 2943 departing. Tinnery admitted totaled 62 as against 14 departing. The bulk of those departing evidently was of ordinary

laborers, the compilation showing with respect to skilled workers that more came in in most instances than departed. The number of common laborers admitted during the six months period was 20,375 as against 109,209 departing.

More of the immigrants gave New York as their intended future permanent residence than any other State. The greatest flow of emigrant aliens was from New York. Immigrant aliens who stated that they intended to live in New York State totaled 38,093 for the six months period as against emigrant aliens from New York State totaling 54,077.

The European country which furnished the largest number of immigrant aliens was Italy. The total number of alien immigrants from Italy during the six months period amounted to 28,837, while emigrants from the United States to Italy totaled 67,371. Immigrant aliens from England totaled 12,717, while emigrant aliens to England amounted to 5556. One country to which a large number of emigrant aliens went from the United States was the Kingdom of the Serbs, Croats and Slovenes. Emigrant aliens going to this country totaled 18,032. Those who went to Greece totaled 13,177, while those going to Roumania totaled 12,264. But few immigrant aliens came to the United States from any of these countries.

Aliens Admitted to and Departed from the United States Since July 1, 1919.

	Immi-	Non-Emi-	Emi-	Non-Emi-	
	grant	grant	Total	grant	Total
1919					
July	18,152	12,967	31,119	25,757	11,069
August	20,597	11,807	32,404	28,934	12,777
September ..	26,584	18,729	45,313	27,770	12,654
October	32,418	17,020	49,438	25,447	12,660
November	27,219	13,902	41,121	36,105	14,864
December	37,913	16,618	54,531	22,199	12,416
1920					
January	31,858	13,549	45,407	27,086	15,095
February	30,606	12,646	43,252	11,609	9,048
March	39,971	14,694	54,665	22,639	7,850
April (estimated)				69,500	25,200
May (estimated)				70,100	30,100
Total	265,318	131,932	536,850	227,544	108,433
					391,277

Rehabilitating the Injured

WASHINGTON, Aug. 3.—The Federal Board of Vocational Education is preparing to carry out the provisions of the recent act of Congress for the rehabilitation of persons injured in industrial work. The new law provides for the allotment of Federal funds for expenditure in the various States, the amount granted by the National Government being matched dollar for dollar by State appropriations. For the present fiscal year, Congress has appropriated \$750,000 and has pledged \$1,000,000 for each of the next three years. These funds have been allotted to the various States on the basis of the proportion the population of the State bears to the population of the United States.

So far six States have accepted the Federal co-operation, three by direct action of the legislatures, and three by act of the governors. These States are Minnesota, Nevada and New York, which have acted through legislatures; and Tennessee, Arizona and Indiana, where the act has been accepted by the governors. Acceptance by other States is expected to follow as rapidly as legislatures meet or formal acceptance is otherwise possible.

It has been estimated that those permanently disabled in industrial occupations from amputations of the hand, arm, leg, feet or a total loss of sight of one or both eyes will total more than 14,000 a year. Without any accurate figures to go on it has been roughly estimated that from 100,000 to 200,000 impaired persons will be re-educated each year under the act. The Federal Board of Vocational Education is authorized to help the States to get satisfactory and effective plans under way, and to advise with them as to the best rehabilitation methods and to see that money is expended in accordance with provisions of the law.

Increased Number of Employees

The iron and steel industry increased its number of employees and also the total amount of the payroll in June, according to the monthly report of the Bureau of Labor Statistics. The number on the payroll in 114 iron and steel plants in June was 5.3 per cent greater than in May. The amount of the payroll was 7.3 per cent greater. The number on the payroll in June was 183,004 as compared with 173,833 in May. The total amount of the payroll in June was \$14,213,114 as compared with \$13,248,900 in May.

More substantial increases were shown for June in comparison with June, 1919. Figures for 113 iron and steel plants show an increase of 12.9 per cent in the number on the payroll in June over June, 1919, and an increase of 40.9 per cent in the amount of the payroll. The total on the payroll for these 113 plants was 190,072 in June, 1920, as compared with 168,332 in June, 1919. The total amount of the payroll was \$14,576,514 in June, 1920, as compared with \$10,346,834 in June, 1919.

Vote for the Open Shop

WASHINGTON, Aug. 3.—By a vote of 1665 to 4 the members of the Chamber of Commerce of the United States have decided in favor of the open shop. This is the outstanding result of a referendum on industrial relations which has been conducted by the chamber, and on which the vote has just been announced. The referendum covered 12 principles outlined by a special committee on industrial relations.

The vote in favor of basing wages on actual production was 1679 to 2. A referendum simultaneously conducted on employment by public utilities resulted in a vote of 1563 against 97 in favor of a law prohibiting public utilities strikes and a vote of 1571 to 100

in favor of the establishment of tribunals to make final and binding decisions in public utilities labor troubles.

The vote on the questions of industrial relations is the largest so far polled in any referendum of the chamber, and demonstrates the great interest which has been roused by the discussions.

The committee that prepared the industrial relations platform was named by the Chamber's board of directors at the close of the President's First Industrial Conference in October, 1919. It was charged with considering the principles presented by the employer's group in the conference. Its members are: William Butterworth, President Deere & Co., Moline, Ill.; Frederick J. Koster, formerly president the San Francisco Chamber of Commerce, San Francisco; Max W. Babb, vice-president the Allis-Chalmers Mfg. Co., Milwaukee; W. L. Clause, chairman of the board, Pittsburgh Plate Glass Co., Pittsburgh; M. J. Saunders, shipping, New Orleans; Henry M. Victor, banker and cotton manufacturer, Charlotte, N. C.

Unemployment in Some Sections

WASHINGTON, Aug. 3.—Effect of traffic conditions upon the iron and steel industry is commented upon in the monthly business review of the Federal Reserve Board for July. One of the features of the general business situation which is noted is the change in labor conditions. Unemployment, the review says, has developed in various parts of the country, due to curtailment of industrial operations, transportation difficulties, the cancellation of orders and the lack of demand. Because of the changed labor situation the Board states that an increase in efficiency of labor has been a matter of general comment.

Relative to labor conditions, the review says:

"One notable feature of the business situation during the month has been a change in labor conditions. An important factor in this connection has been the development of unemployment in various parts of the country. This unemployment has been apparently chiefly due to three factors. Where poor transportation prevented deliveries of fuel and raw materials, some plants have been obliged to curtail operations and thereby reduce opportunities for employment pending better conditions; in other manufacturing districts, the shutting down of mills as a result of cancellation of orders and lack of demand had also thrown considerable forces of men out of work; elsewhere, inability to obtain capital for construction and consequent abandonment or suspension of undertakings that had been contemplated have produced a certain amount of unemployment with some shifting of workers from one occupation to another. An effect of the changed labor situation, which has been the subject of quite general comment in the various Federal Reserve districts, is an increase in the efficiency of labor."

Labor Turnover Reduced

DETROIT, Aug. 2.—The labor turnover in Detroit is now lower than it has been for many months. While the turnover in Detroit factories is normally lower than in other industrial communities of the State, following the war there was much shifting about, which has ceased to a great extent. Factories are now getting as many men as they want and contractors are able to maintain their crews. An indication of the situation is given by the example of one large factory organization, the C. R. Wilson Body Co., Detroit, which has set an expert to work shifting men to the jobs for which they are best fitted and weeding out the low producers.

The average wages of structural iron workers in 1920, according to statistics collected by the Bureau of Applied Economics, Washington, was \$1.167 per hr. on the basis of an average wage rate in 32 cities against \$2.1c. in those same cities in 1914. The number of hours worked per week averaged 44 in 1920 and 44.5 in 1914.

In the Field of Labor

The New England Brass Foundry Co., Worcester, Mass., has made application for an injunction in the Superior Court to restrain the iron moulder's union from interfering with the conduct of its business.

Prospects for a general strike at the Fore River Works, Bethlehem Shipbuilding Corporation, Quincy, Mass., have been reduced to a minimum by the re-employment of one worker, an officer of the metal trades' council. The man was discharged pending a settlement of a strike of approximately 200 riveters.

The Andrew Terry Co., Terryville, Conn., castings, has granted another increase of 10 per cent for all employees. The company is booked far ahead on orders and is working at capacity. It has enough coal on hand to last throughout the winter.

Judge A. B. Anderson of the Federal Court at Indianapolis has issued a temporary injunction against 19 members of the International Iron Molders' Union of America charged by the Muncie Malleable Foundry Co., Muncie, Ind., with using violent methods to compel the company to adopt a closed shop. The company presented affidavits of 195 of the 200 employees of the company that each of them was satisfied with the working conditions of the foundry and with the hours and the pay and each declared he did not desire to join the union. The 200 employees represent 60 per cent of the normal working force of the foundry, the others, it is alleged, being driven away from the foundry through fear of the defendants.

The Lafayette Motors Co. of Mars Hill, Ind., a suburb of Indianapolis, has under way 53 houses of the 150 it has undertaken to build, in order to solve housing problems for its employees. The houses are within easy walking distance of the plant. The Lafayette Building Co., with \$1,000,000 capital stock, was organized to finance and manage the undertaking. M. G. Moore, secretary-treasurer of the motors company, is president of the building company. No two of the houses are alike.

The principle of the open shop has been approved by 322 members of the Chamber of Commerce, Providence, R. I., on referenda submitted by the Chamber of Commerce of the United States.

Saturday, Sept. 18, has been selected as the date for the seventh annual harvest day of the employees of the Norton Co., Worcester, Mass., grinding wheels. The annual sales conference of the company will be held in connection with harvest day. Carl F. Dietz, vice-president and general sales manager, is arranging details of the sales conference.

Industrial Conference at Lake George

"Human Relations in Industry" is to be the topic of general discussion at a week-end industrial conference to be held at Silver Bay on Lake George, New York, Aug. 27 to 29, under the auspices of the Eastern Industrial Summer School of the Y. M. C. A. At a similar conference last year over 500 people attended and it is expected that the attendance record this year will go beyond the 600 mark. Among the speakers to appear at the conference are Clarence H. Howard, president Commonwealth Steel Co. (presiding at closing session); Roger W. Straus, American Smelting & Refining Co.; Allen T. Burns, Carnegie Foundation (to speak on "The Coming America and the Resident Alien"); Fred B. Smith, H. W. Johns-Manville Co. (to speak on "The Industrial World To-day"); George E. Emmons, vice-president General Electric Co.; F. J. Kingsbury, president Bridgeport Brass Co.; Charles D. Knight, vice-president Sprague Electric Works; R. B. Wolf, consulting engineer (to speak on "Religion in Industry"); J. Parke Channing, vice-president Miami Copper Co.; John Calder, manager of industrial relations, Swift & Co. (to speak on "The Foremen"); Roger W. Babson, president Babson Statistical Bureau (to speak on "Fundamentals of Prosperity"), and John Leitch, president John Leitch Co. (to speak on "The Constructive Adjustment of Industrial Relations").

No Increase in Ore Rates to Upper Lake Ports

Flat Percentage Advances in Railroad Freight Charges to Be Adjusted to Preserve Existing Relationships and Differentials

WASHINGTON, Aug. 3.—Readjustment of freight rates to preserve to a great extent existing recognized relationships and differentials will follow the general increase ordered by the Interstate Commerce Commission. The commission explained that it seemed advisable to make its increases on a flat percentage basis, but that the railroads had promised to confer at once with interested shippers with a view to such adjustments as may be proper.

The railroads got substantially what they requested both with respect to increased freight rates and as to the passenger rates. An increase of 40 per cent was ordered for freight rates on the Eastern roads, 35 per cent on the Western roads, 25 per cent in a new Mountain-Pacific group, composed of railroads west of Colorado points, and 25 per cent in the Southern group. The Eastern roads had asked for approximately 40 per cent increase, while the Western roads, including both the new Western group and the Mountain-Pacific group, had asked for approximately 32 per cent as against the average of about 30 per cent which they were given. The Southern roads asked for approximately 38 per cent, but the commission thought that their needs had been overestimated and cut them to 25 per cent.

Passenger rates were increased 20 per cent, excess baggage rates 20 per cent, milk rates 20 per cent, and a surcharge of 50 per cent was added to sleeping and parlor car tickets.

The increased rates are designed to make it possible for the roads, in the light of increased operating costs due to the war and the recent \$618,000,000 wage advance, to earn the full 6 per cent on the aggregate value of its properties. The commission valued the roads at \$18,900,000,000 as compared with \$20,040,572,611 as indicated by the property investment account of the roads.

Discussing the situation with respect to various commodities such as iron ore on which hearings were held the commission in its decision says:

"Considerable evidence was presented with respect to the rates upon a number of individual commodities, including coal, lumber, cement, fruits and vegetables, petroleum, brick, sand, gravel and rock, asphalt, slag, grain, live stock, packing house products, ore, bullion, potash, salts, fertilizers and terra cotta.

Recognition of Departures from Differential Rates

"Various issues have been raised or are presented as to these commodities, the principal of which are as follows: (a) Whether there should be departures from the general percentage increases by maintaining differentials or by the application of specific increases instead of percentages; (b) whether maximum increases should be provided in order to avoid the full percentage increase upon relatively high rates from distant points of production to important markets; (c) whether because of the high cost of production and marketing of some commodities the percentage increases proposed by carriers will result in a cost delivered at points of market or consumption so great as to curtail production and distribution, an undesirable situation at this time of world shortage of commodities; (d) whether a more general necessary use warrants a lower transportation charge; (e) whether the rates effective June 24, 1918, before general order No. 28 became effective, should be made the basis of readjustment now by applying thereto a 25 per cent increase and superimposing thereon the percentage increases now found reasonable. Our general conclusion as to the impracticability of specific increases or of attempting now to maintain differentials dispose of a number of these contentions. It should also be said that while we do not here sanction specific

increases in lieu of percentages, we are not to be understood as expressing disapproval of increases of that character made by the Director General. Such increases were made under war conditions and under circumstances that do not now exist.

"Our attention was called at the hearing of a number of formal complaints now pending, and we are asked to except from the general increase the rates in issue in those complaints. This would have the effect, during the pendency of those proceedings, of giving the rates in question a preferred standing and of exempting them from the general increase. In our opinion a fairer disposition will be attained by applying the general increase to these rates, with the understanding that this action is without prejudice to any future findings."

No Increase on Ore to Upper Lake Ports

The commission holds that at this time there shall be no increases in the rates on iron ore from the Minnesota or Michigan ranges to Lake Superior or upper Lake Michigan ports. Other rates on iron ore are to be increased according to the general percentage. On the subject of iron ore the commission says:

"A considerable proportion of iron ore consumed in the United States originates in Minnesota and Michigan near the head of Lake Superior. This ore moves to furnaces on Lake Michigan and Lake Superior; to furnaces on Lake Erie and in Pennsylvania, Ohio and other states. The movement is by rail to the upper lake ports, and when destined beyond, by lake vessels to the lower lake ports.

"Because of the keenly competitive situation between the respective furnaces the Director General adopted a specific increase of 30 cents per ton upon iron ore in lieu of a percentage, which was applied to the movement from the Michigan and Minnesota ranges to the upper lake ports, but not from lower lake ports to Eastern destinations, thus resulting in an equal increase in cents per ton for the rail transportation to each of the competing furnaces. Under this plan the rates of the Western carriers up to the lake ports were increased approximately 57 per cent, whereas the rates of the Eastern carriers from the lower lake ports were not increased.

"In this proceeding the Eastern carriers propose first to apply an increase of 22 cents per ton and then impose thereon the general percentage increase. The testimony of ore shippers is conflicting, some proposing no further increases from the ranges to the lake ports, some favoring double increase in the rates from the lower lake ports, others proposing no exceptions to the general percentage increases proposed on traffic generally.

"The returns made by the principal ore-carrying roads from the Minnesota ranges to Lake Superior ports indicate that such lines are in a much more prosperous condition than the Western carriers generally.

"It is concluded that at this time no increases should be made in the rates on iron ore from the Minnesota or Michigan ranges to Lake Superior or upper Lake Michigan ports. Other rates on iron ore may be increased according to the percentages herein approved."

O. F. S.

The first addition to the lake fleet of bulk freight boats in several years has been made by the purchase by G. A. Tomlinson, Duluth, Minn., and James E. Davidson, Bay City, Mich., of two of the four boats that the American Shipbuilding Co. started to build some time ago on its own account. The boats are named L. M. Bowers and M. E. Farr. The two boats are ready to go into commission.

End of Coal Strike in Sight

CHICAGO, July 31.—The coal strike which has stopped production in Illinois mines for a week and a half and which spread from this State into Indiana, will probably come to an end, at least temporarily, as a result of a letter which President Wilson addressed to the United Mine Workers of America on July 30. The President takes the union to task for violating the terms of the wage agreement of last spring and states that any action on his part to adjust alleged inequities in present wage scales is conditional on an immediate resumption of work by the miners. If the miners demonstrate their good faith by returning to work, the President promises to invite the scale committee of the operators and miners to reconvene for the purpose of adjusting any such inequalities as they may mutually agree should be adjusted.

The action of the President removes the objection of the operators that a wage conference would lay them open to indictment. At the same time, it has given John L. Lewis, national president United Mine Workers, a substantial reason for ordering the men back to work, which he announced his intention of doing when he learned of the President's message. Despite the unfriendly feeling between Frank Farnum, head of the Illinois miners, and Mr. Lewis, it is generally felt that the latter's order will be obeyed.

While an early resumption of mining seems probable, the loss in production during the past 10 days has resulted seriously for steel plants in the Chicago district. All of the works have been running on a dangerously low supply of fuel ever since the outlaw railroad strike was called in April, and the recent tie up in coal production in Illinois and Indiana has accentuated an already precarious situation. The leading steel interest, in fact, was forced to bank fire blast furnaces at the opening of this week, and the foremost independent, owing to the commandeering of coal shipments by the railroads, will probably be forced to suspend operations in the mills of its No. 2 plant.

Standard Parts Co.'s Financing

The Standard Parts Co., Cleveland, has announced permanent financing plans which provide for the retirement of \$6,000,000 7 per cent preferred notes maturing Sept. 5, 1920, and the issue of \$8,000,000 five-year first mortgage collateral trust 8 per cent gold bonds and 80,000 shares of common stock. The notes are to be secured by first mortgage on the fixed assets of the company including machinery and equipment and a pledge of the common stock of the Bock Bearing Co. The number of common and preferred shares authorized will remain as at present. Outstanding common stock of \$100 par value will be exchanged for new common stock. It is announced that the company's earnings during the four months from March to June inclusive, under the new management, produced a profit of \$778,021. During January and February before the reorganization the loss in operation of company's plants amounted to \$197,000. It is announced that various economies in operation have been adopted by the present management.

The plants have been organized into five main divisions, the Standard Welding division with one plant in Cleveland, the Perfection Spring division with plants in Cleveland and Canton, Ohio, and Pontiac, Mich., the Eaton Axle division with two plants in Cleveland and one in Cincinnati, the Bock Bearing division with plants at Toledo, and the Vehicle division at Connersville, Ind.

Ore Shipment Satisfactory in Chicago District

Whereas blast furnaces in Ohio and elsewhere are experiencing difficulty in connection with ore shipments, principally because of the shortage of railroad equipment required to move ore from the docks inland, stacks in the Chicago district are well supplied, most of them being located on Lake Michigan. The leading steel interest has thus far received about 4,000,000 tons, or 1,000,000 tons in excess of what was shipped up to this time a year ago. The foremost independent

steel interest in the Chicago district is 50,000 tons behind schedule but does not anticipate any difficulty in securing a full supply before the close of navigation. Receipts by the Steel & Tube Co. of America and the Wisconsin Steel Co. are up to schedule.

Navy Lists of Excess Bolts, Nuts, Rivets and Washers

The Navy Sales Board in Washington announces that a consolidation of lists of steel and iron bolts, nuts, rivets, and washers is being made into a new catalog. These articles are now being held in large quantities at the various navy yards and are to be sold by sealed bids. This catalog will include all classes of bolts with and without nuts, hexagonal and square head, black and galvanized. It will include all styles such as standard, carriage, stove, eye, forcing, stud, etc. Separate nuts are round and hexagonal, black and galvanized, and standard and case hardened. Rivets are ship, boiler and structural. Washers are both iron and steel. It is suggested that all prospective purchasers of these articles send their names in at once to the Board of Survey, Appraisal and Sale, Navy Yard, Washington, D. C. This will insure receipt of a catalog as soon as it is ready for distribution.

A new steel catalog is also under consideration which will contain approximately 20,000 tons of plates, sheets, shapes, bars and billets.

Organization of Wheeling Steel Corporation Completed

Organization of the Wheeling Steel Corporation, Wheeling, W. Va., practically was completed at a meeting held at that city July 29, with the election of T. W. Hocking as secretary; W. J. Stoop and W. D. Higgins as assistant vice-presidents; W. T. Burt as comptroller; J. M. Ross as auditor; E. D. Adams as purchasing agent of white metals and H. L. Schreck as chief engineer. For purposes of incorporation W. D. Higgins had acted as secretary of the company. Otherwise, the officials are the same as published in THE IRON AGE July 22. The company recently purchased the Schmaltz Building, which is the largest office building in Wheeling, and in it will be located the general offices.

Deepen River Serving Interstate Iron & Steel Co.

Through the agreement of the Great Lakes Dredge & Dock Co., Chicago, to reduce its bid for blasting out rock in the Calumet River between 111th and 114th streets, South Chicago, it is believed that the Government will authorize the work to go ahead without delay. The improvement will be advantageous to the Interstate Iron & Steel Co. as well as other industries, as it will permit lake vessels to pass through this section of the river under full cargo.

The New Brunswick Rolling Mills Co., Ltd., St. John, N. B., recently formed with a capital stock of \$99,000, has taken over the plant of the Portland Rolling Mills Co., Strait Shore, St. John, and is now producing bar iron in all sizes, railroad spikes, ship spikes, track bolts and mild steel bars. The company has not yet completed its organization, but the provisional president is H. J. Garson; secretary, John A. Garson; superintendent, C. H. Lissimore.

The members of the Cleveland Engineering Society will make a mid-summer excursion trip to Detroit, leaving by boat Aug. 27 and spending the following day in that city as guests of the Detroit Engineering Society. During the day they will visit the new blast furnace plant of the Ford Motor Co.

A survey of the iron and steel trade of the Dutch East Indies by Trade Commissioner John A. Fowler, Batavia, Java, shows that rails are needed by the State Railways and for many tram lines throughout Java and in Madura and northern Sumatra.

Balanced Skip-Hoist Transporter

A balanced skip-hoist transporter noteworthy in that the horizontal transportation is combined with the hoisting operation in a single machine has recently been patented by Warren Travell of the Exeter Machine Works, 30 Church Street, New York, and is now being manufactured by the Exeter company.

In order that the skip may be able to carry its load both vertically and horizontally without spilling, a radical change has been made in the form of its construction. An opening is provided in the upper portion of the front side for receiving the load, and single or double hinged doors on the opposite side for discharging the load when the skip is running on a horizontal track.

The filling of the skip is accomplished preferably by a chute from a hopper. The gate controlling the flow of material through the chute may be operated by hand or an automatic filling device may be installed by which exactly the right amount of material is measured and discharged into the skip without requiring any manual labor or attention of the operator.

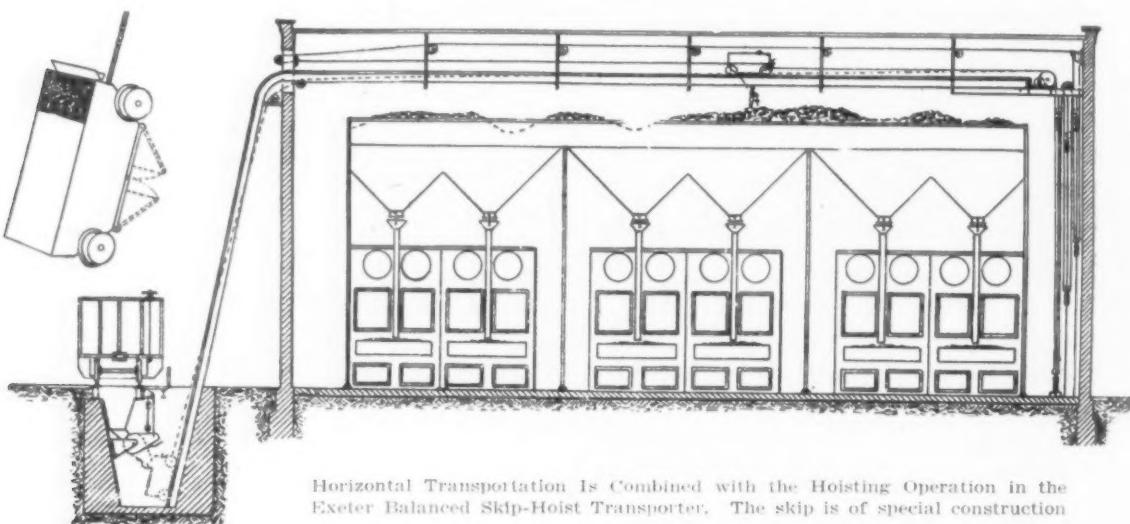
The doors or valves of the skip are held in closed position by a latch. Discharging of the skip's load is accomplished by the tripping of this latch. For installations having a fixed point of discharge, the latch-trip is fixed in position alongside of the track; if, however,

device, the skip-hoist is made entirely automatic in its operation and requires the occasional services of an operator only to keep the machinery oiled and to shift the traveling tripper in case this is used.

The skip may be of any suitable capacity, and the height of lift and length of run of any reasonable distance to suit the requirements of an installation. The manufacturer states that in the case of a boiler house with a skip-hoist transferring coal from a railroad track hopper to an overhead bunker, an equipment of this type having a skip of 1 ton capacity with a travel speed of 500 ft. per min. will handle coal at the rate of 80 tons per hr. With a skip of 2 tons capacity, the rate of handling is increased to 150 tons per hr.

Annealing Without Tarnishing

A method for protecting polished metals which have to undergo annealing, from the tarnishing which under ordinary treatment occurs, has been patented by H. Schultz, Charlottenburg, Germany, of whose process an account appeared recently in the *Zeitschrift für Dampfkessel und Maschinenbetrieb*, and which has been abstracted in *The Technical Review*, London. In this process a solution of boric oxide is used, completely excluding atmospheric oxygen, although it is only applied as a very thin film over the articles to be annealed. It melts at a temperature varying between 550 and



Horizontal Transportation Is Combined with the Hoisting Operation in the Exeter Balanced Skip-Hoist Transporter. The skip is of special construction

it is desirable to dump the skip at different points along its horizontal travel as in the case of filling the overhead coal bunker of a boiler house, the latch-trip may be shifted along the track as required. A further improvement consists in having the trip carried on a traveling frame which is moved back and forth by a hand-winch conveniently located.

A feature emphasized consists in the balancing of the entire weight of the skip and half of its load by a counterweight which operates only during the vertical motion of the skip. In lowering the empty skip, the motor works to raise the counterweight, doing the same amount of work as in hoisting. As the weight of the skip is frequently as great as that of the load itself, the effect of this arrangement in such a case, it is explained, is to reduce the size of the motor and the unbalanced strains in the hoisting machine to one-quarter of what is required for the ordinary unbalanced hoist, or to one-half of that for the less common type of double hoist in which two skips are used to balance each other. A second counterweight of normal size is employed to take up slack rope paid out from the hoisting drum during horizontal travel of the skip.

On reaching the top of the vertical rise, the skip engages and carries along with it a bar which is connected by cable to a third counterweight which operates to pull the skip backward after being discharged.

Manual labor in connection with the skip-hoist is reduced by the installation of automatic switches which reverse the motor at both ends of the skip's run. By this means, in combination with the automatic filling

650 deg. C., according to its composition, and acts as a protection so long as it remains solid. Steel, for instance, remains bright when heated to the melting point of the composition, and no coloration takes place when the steel is tempered. It is still more effective in the molten or semi-molten condition, as it then forms a perfectly gas-tight cover round the article, even when heated to the highest temperature used in practice. The coating is perfectly fireproof, does not evaporate, and dissolves any oxidized matter on the surface of the heated metal. The coating can be applied either as a powder, sprinkled or dusted over the surface of the objects to be annealed, or as a liquid. It is soluble in water and methylated spirit, and the work to be annealed is simply dipped in the solution and allowed to dry. The coating peels off on cooling, or it may be dissolved in warm water.

The Allsteel Supply Co. of Niles, Ohio, has just completed a warehouse on a 20-acre site in Niles, tapped by the Pennsylvania, Baltimore & Ohio and Erie railroads. The new building is 50 x 100 ft., steel and concrete construction, and was furnished and erected by the Truscon Steel Co. It has a capacity for 1500 tons of steel. A resquaring shear with a blade 156 in. long and capable of shearing plates $\frac{1}{4}$ in. and lighter has been purchased from the United Engineering & Foundry Co. and is installed. A roller level and presses for flat stampings are to be added. The building has a concrete loading platform 8 ft. x 120 ft.

LARGE STOCK DISTRIBUTION

Harvester Company's Liberal Plan of Extra Compensation to Employees

Stock ownership and extra compensation on a scale of unusual liberality are provided for in a plan adopted by the directors of the International Harvester Co., and ratified by the stockholders at a meeting held at Hoboken, N. J., on July 29. First there was adopted an extra compensation and stock ownership plan which is open to all the company's employees in the United States and Canada, with certain limitations regarding length of service. The plan, which becomes effective as of Jan. 1, 1920, provides for the annual distribution of a fund which will be 60 per cent of the company's net profit for the year in excess of 7 per cent upon the capital invested in the business, as represented by the issued preferred and common stock and the surplus.

General Employees' Group

Under the plan the employees are divided into two general groups. One group, embracing all eligible employees except those in executive or managerial capacities, will receive two-thirds of the extra compensation fund, part in the company's 7 per cent cumulative preferred stock at par and part in cash. This fund will be distributed to the employees in this group in the proportion which the actual earnings of each employee for the year bear to the aggregate earnings of all employees of this group sharing in the distribution.

A condition of participation is that an employee shall have been continuously in the company's service during the calendar year in which the extra compensation fund is earned and until it is distributed, which will be about May 1 of the following year. Employees voluntarily leaving service during the above period—except on account of death or being pensioned— forfeit their right to participate.

If an employee is retired on pension or dies while in service the share that would have been paid to him had he worked throughout the period will be payable to him or his estate. Employees who have worked throughout the entire calendar year, but who may be discharged for any cause between the end of such year and May 1 following, will receive their share of the fund. The right of an employee to leave the company's service for any reason and the company's right to terminate the services of any employee for any reason remain unaffected by this plan. It is provided, however, that an employee receiving preferred stock under the plan must, in addition to continuous service, hold the stock so acquired in order to share in future distributions.

Compensation for Managers and Foremen

The second group embraces those in executive and managerial capacities, such as assistant foremen, foremen, superintendents, etc., in the company's various works, mines and mills; branch managers and certain others in the selling organization; also department heads and the important men in the general office at Chicago. This group will receive one-third of the extra compensation fund apportioned as nearly as possible according to the value of their services to the company, this apportionment to be made by the directors. Conditions of participation for this group are the same as for the employees in group 1, but common stock at par is distributed instead of preferred stock at par.

The stockholders at their meeting authorized an increase in the preferred stock of \$40,000,000, and in the common stock of \$20,000,000, for this purpose, which it is believed will cover the requirements under the plan for some years to come. The stockholders further authorized an additional \$30,000,000 of common stock, of which \$10,000,000 will be used to pay a 12½

per cent stock dividend on the present \$80,000,000 of common stock. The directors will meet shortly to declare this stock dividend. The remainder, \$20,000,000, is available for the payment of 2 per cent semi-annually.

The action of the stockholders increases the authorized preferred stock from \$60,000,000 to \$100,000,000 and the common stock from \$80,000,000 to \$130,000,000. The surplus of the company on Dec. 31, 1919, was \$71,600,000.

Commenting on the extra compensation and stock ownership plan, Harold F. McCormick, president, said:

The directors believe that this plan, which is the result of careful consideration and thought on the part of the executives and directors of the company extending over a long period, will round out a policy of relations with the company's employees which should produce results highly satisfactory to both stockholders and employees. A plan put into effect by us in December, 1915, has demonstrated that the employees welcome an opportunity to become stockholders of the company. The plan just adopted is much more comprehensive than anything heretofore undertaken by us along this line and, it is believed, will appeal strongly to the Harvester organization.

This distribution furnishes a distinct incentive to every employee to do his full share, for upon individual effort and team play will depend in a large measure the amount of the annual extra compensation to each employee who is entitled to participate.

The stockholders of the Harvester company are to be congratulated on the loyalty to their interests shown by the employees of the company during the past year.

The steel trade is interested in the plan outlined above, since it will apply to the employees of the Harvester company's iron mines, blast furnaces and steel works. Up to 1917 these latter operations were carried on by the Wisconsin Steel Co., but the latter is now only the sales agent of the International Harvester Co. for some of its steel products.

At the end of the eight or ten years likely to pass before the distribution of the large block of shares the employees are to receive, the latter will own an interest of slightly more than 20 per cent of the Harvester company's stock, on the basis of current authorized capital issues. Such an interest would naturally suggest representation on the board of directors.

The Steel Corporation's stock arrangement differs in that its employees pay for the stock they acquire, but they are credited with a premium of \$5 a share each year for the first five years the stock is held.

New \$35,000,000 Road Machinery Corporation

A corporation with a \$35,000,000 capitalization has been formed through the consolidation of the F. C. Austin Machinery Co., Inc., the Linderman Steel & Machine Co., the F. C. Austin Drainage Excavator Co., Municipal Engineering & Contracting Co. and the Toledo Bridge & Crane Co., at Winthrop Harbor, Ill.; Muskegon, Mich.; Toledo, Ohio, and Woodstock, Ont. It is rumored that the consolidation is not complete and that other large plants will shortly be taken over. The new name of the company is the Austin Machinery Corporation, with B. A. Linderman, president.

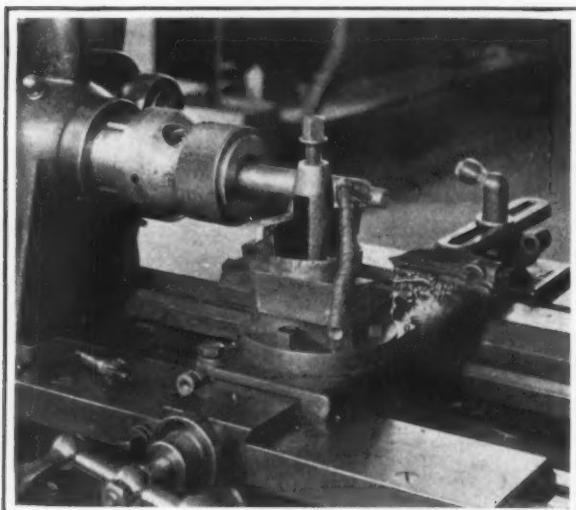
Ralph Crews, director of the National City Co., New York; Clay H. Hollister, president Old National Bank, Grand Rapids, Mich.; B. A. Linderman, president Linderman Steel & Machine Co., Muskegon, Mich.; Samuel McRoberts, formerly vice-president of the National City Bank, New York; C. A. Peckham, president Toledo Bridge & Crane Co., Toledo, and John R. Shaw, president Canadian Manufacturers' Association, Woodstock, Ont., are directors of the new company.

E. B. Taylor, for many years associated with W. E. Clark & Co., Boston, and G. F. Wason, have formed the Taylor-Wason Corporation for the purpose of supplying structural steel, reinforcing bars, merchant bar steel and iron, forgings, etc., to iron workers, mills and railroads. The company has a temporary yard at Cambridgeport, Mass., but expects to occupy at an early date its new storage yard and warehouse located on the Boston & Maine Railroad, North Cambridge. The sales office is at 40 Court Street, Boston.

Draw-in Collet Chuck

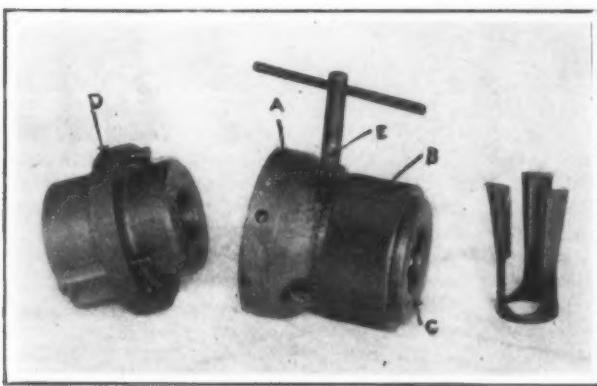
An advantage of a new draw-in collet chuck to which the manufacturer, the J. M. Ney Co., Hartford, Conn., directs attention is the fact that the tool can be tightened properly without the ordinary long tube through the lathe spindle and the hand wheel at the extreme rear of the machine. The chuck is quite hollow and as a result the opening in the lathe spindle is free of obstructions. The chuck possesses advantages, it is pointed out, that make it well adapted for use with screw machines. It also lends itself well for use on milling machines, grinders and drill presses.

Six collets ranging by $\frac{1}{8}$ -in. sizes from $\frac{3}{8}$ in. to 1



Draw-In Collet Chuck Used on Lathe and Holding 1-In. Cold Rolled Bar Which Protrudes 5 1/2 In.

in. are provided with each chuck. Considerable flexibility is obtained since each collet may be used on work 1/32 in. over or under size. Referring to the disassembled view of the tool shown herewith, it can be seen that the chuck consists of a body A, sleeve B, nose piece C, adapter D and a binding key. The nose piece is provided with threads on the outside which run in the threaded portion of the sleeve. Turning the sleeve causes a longitudinal travel of the nose piece, thus bringing it against the collet and causing it to draw in by being forced into the ground cone-shaped opening within the body. This opening fits a similarly conical



Disassembled Parts of Draw-In Collet Chuck

shaped outside part of the collet. Considerable tightening pressure is brought about by means of the gear teeth on the sleeve and the pinion key E.

The longitudinal thrust which is imparted to the sleeve is taken up by a row of 26 ball bearings, which insure easy running of the chuck. Collets may be changed by turning the sleeve till the nose piece comes out entirely. The adapter is provided with three drilled and counter-bored holes properly spaced to fit into three tapped holes in the body. There are also three tapped holes in the rim of the adapter in which screws may be placed in case it is necessary to remove the adapter.

British Steel Exports in June and the First Half

British steel exports in June this year, excluding iron ore and including scrap, were 287,655 gross tons, which compare with 332,869 tons in May, with 274,337 tons in April and 262,676 tons per month in the first quarter. The June figures exceed the outgo for any month in 1917, 1918 or 1919, and, while less than in May and March, they are larger than any other month thus far this year. The June exports in 1919 were 196,132 tons. The total for the half year is 1,682,890 tons, or about 660,000 tons in excess of the first half of 1919, when the total was 1,020,839 tons.

Iron and steel imports in June this year were 131,476 tons, or the heaviest for any month in several years. They are practically equal to the total for any two months this year previous to June. In June, 1919, the imports were only 40,886 tons. Imports for the first half are double those for the first half of 1919.

The following summary gives the relative exports and imports of the first quarter and first half, and for April, May and June, 1919 and 1920, as well as the average per month for 1913 and 1919 in gross tons:

	Exports	Imports
Average first quarter, 1919	147,228	44,713
April, 1919	174,219	15,598
May, 1919	208,804	35,276
June, 1919	196,132	40,886
Average first half, 1919	170,139	37,483
Average first quarter, 1920	262,676	74,501
April, 1920	274,337	71,161
May, 1920	332,869	83,431
June, 1920	287,655	131,476
Average first half, 1920	280,481	84,926
Average per month, 1913	120,757	195,264
Average per month, 1919	204,516	51,557

The trend of some of the principal exports is shown by the following data in gross tons:

	Av. Per month, 1913	Av. Per month, 1919	June, 1919	June, 1920
Pig iron	78,771	21,503	22,829	43,358
Steel rails	41,676	10,435	15,220	8,948
Steel plates	11,162	19,996	24,479	14,882
Steel bars	20,921	20,787	25,882	34,292
Galvanized sheets	63,506	15,508	10,201	45,826
Tin plates	41,208	24,147	21,468	32,756
Black sheets	5,679	11,109	10,953	11,014

The principal export gains in June, 1920, over June, 1919, and the 1919 monthly average have been in pig iron, steel bars, galvanized and black sheets, and tin plates. Pig iron imports in June were 19,869 tons against 5722 tons in June, 1919. The average per month in 1919 was 13,623 tons and in 1913 it was 18,059 tons per month.

Iron ore imports in June, this year, were 679,179 tons, bringing the total to July to 3,459,508 tons, as compared with 2,555,884 tons to July, 1919.

Manganese ore imports in June, 1920, were 38,685 tons. These compare with 15,380 tons in June, 1919, and with 50,098 tons per month in all of 1913. The total for the first six months of this year has been 179,066 tons against 194,601 tons to July 1, 1919. The average per month in 1919 was 22,150 tons.

Pig Iron Shortage in Scotland

WASHINGTON, Aug. 3.—Shortage of pig iron is seriously affecting the iron and steel trades in Scotland, according to Trade Commissioner Wilbur J. Page.

"The astonishing statement that manufacturers in the iron and steel trades in Scotland could, with the orders that are on their books at the present time, use 40 to 50 per cent more of finished and semi-finished steel and foundry iron is corroborated by leading firms in the industry," says Mr. Page. "The cause of this shortage in Scotland is the extreme scarcity of Scotch and Cleveland pig iron."

Sales of Greaves-Etchells Furnaces

The Electric Furnace Construction Co., Philadelphia, announces recent sales of Greaves-Etchells electric furnaces to Dodge, Carrigan & Favorite, Philadelphia, and the Electric Steel Products Co. of Turners Falls, Mass.

Large German Steel Companies Combine

War Losses Force Consolidation—Talk of Reviving International Trade Agreements—Prices Still Falling and Exports Shrink

(Special Correspondence)

BERLIN, GERMANY, July 13.—The chief event in the trade since my last report is the completion of the deal between Gelsenkirchen and Deutsch-Luxemburg, which has already been referred to several times in this correspondence. The transaction, which was concluded last week, provides for a practical amalgamation for a period of 80 years, beginning with next October. The companies will be operated as one concern in all respects, except that each maintains its own existence and will declare its own dividends; profits will be divided equally.

This community-of-interests arrangement is the largest transaction of the kind that has ever occurred in the German iron trade, or in any other branch of German industrial finance. Each company has a capital of 130,000,000 marks. That of Gelsenkirchen had been as high as 188,000,000 marks, but it wrote off 58,000,000 marks several months ago, representing the properties lost in Luxemburg and south of the Rhine through the treaty. With its combined capital of 230,000,000 marks and a considerable amount of bonds outstanding, the amalgamation will be the strongest one in the German iron trade.

In the communiqués given to the newspapers it is pointed out that Germany in future will be compelled, in the coal and iron trades, to avoid as far as possible the export of coal and pig iron and instead to employ these materials for working up steel into the most highly finished products for export, thus giving greater opportunity for the employment of German labor, and the consolidation is regarded as a step in that direction.

Gelsenkirchen was originally a coal company, but began to annex iron companies 10 or 15 years ago; and it completed and put into operation a great modern iron and steel plant in Luxemburg several years before the outbreak of the war. The loss of that establishment and another one left Gelsenkirchen with more coal than it could utilize in its own plants. On the other hand, Deutsch-Luxemburg has large mills at Dortmund (the old Dortmunder Union, absorbed some years before the war) which are situated in close proximity to some of Gelsenkirchen's coal mines; and Deutsch-Luxemburg itself has lost some of its coal property. It also has been attaching other steel-consuming establishments during the past few months. The consolidation, therefore, will work in the direction of cheapening production by using up, so far as possible, the raw materials of the two companies in their own mills.

The heads of the new concern will be Emil Kirdorf, of Gelsenkirchen, and Hugo Stinnes, of Deutsch-Luxemburg. The head business manager will be Herr Vogler, of Deutsch-Luxemburg, who like Stinnes, is a member of the Reichstag. The head office will be at Düsseldorf. The companies will divide the profits equally.

Further Decline in Steel Trade

The tendencies toward declining trade noticed in my last report have continued with growing intensity. Mills are now filling orders in much shorter time than previously. One report remarks that any desired quantity of finished material can be had in a short time after specifications are in hand. Consumers are still holding back and already there are many complaints about a shortage of orders in hand. Some

establishments are already working on short time in order to avoid discharging laborers. Iron and steel continues to be offered for sale from irregular sources in larger amounts, which shows that the hoarders of these goods have been frightened by the reactionary tendency of prices. It is believed that the dullness of trade will continue for a rather long period.

A partial improvement in the demand for structural steel is about the only good point mentioned; but this is of modest dimensions, and it is not expected that the demand will rise to any considerable volume in view of the enormous expense of building operations under existing conditions. Despite the great need for house room in all the larger cities and in the great Ruhr industrial region itself, very few persons will risk putting money into buildings or are able to raise it at all for that purpose. It is further reported that the demand for rails for mines is fairly good, as there is a tendency toward greater activity in coal and potash mining.

Cancellations of Foreign Orders

The foreign market continues to disappoint the hopes of producers. The improved quotation of the mark is still reacting upon sales abroad. Manufacturers of the more highly finished products, machine shops and construction shops, report the cancellation of large foreign orders; and this has caused a considerable restriction of production. The prospects for the remainder of the year are characterized as uncertain. The fact is noted with interest in the German trade that a decline of the export business is also reported from several foreign countries. It is probably due to this fact that talk is now heard in the trade about negotiations for the renewal of the international price and distribution agreements existing before the war; but this is all evidently still very much in the air. Much complaint is still heard about the difficulties of the export business due to the export duties collected by the Government, and especially by the requirement of a Government permit to export goods. As it usually requires a month or more to get a permit put through the bureaucratic machine, it is easy to see that this machine is a great discourager of trade. It is mentioned in particular that users of German machinery abroad are hard hit when it comes to ordering a part to replace one broken or worn out, since the machine in such cases must stand idle for months.

Prices Still Tend Downward

While there has been no great concerted reduction of prices since June 1, the tendency is still downward. A number of minor reductions have been reported within a few weeks, and official prices are no longer firmly held. Thus while the official price for bars is 3,200 marks they can be bought at 3,000 marks from some first-class producers and from dealers; and some offers at 2,800 marks are mentioned. In the Saar district, where bars are nominally quoted at 5,500 marks, sales are actually made at about 1,000 marks lower. Annealed castings have been cut 85 marks per 100 kilograms to 1,365 marks. Waste and old iron is offered at less than 600 marks a ton, equivalent now to about \$16 a ton. Steel castings have been reduced 10 per cent. A similar cut has been made on machinery and general commercial castings. The manufacturers of these latter also report growing difficulties in effecting sales, together with the cancellation of orders. In

view of the weak tendency of prices much interest attaches to a meeting to be held by the Business League about the end of the month to fix the August scale. Diverse views are reported as prevailing in the trade as regards a further all-round cut; but general conditions are interpreted as strongly pointing to such a decision.

Notwithstanding the unsatisfactory shape of the trade already outlined, the German works are inadequately supplied with pig iron. Hence imports from England are being made in small amounts. From English sources it appears that these shipments amounted to 1,447 tons in June, after having begun in February with 500 tons. Whether such imports will continue may be regarded as very doubtful.

French Cut Down Iron Ore Supply

The arrivals of minette ores from Lorraine and Luxemburg in the Ruhr district are quite unsatisfactory, the French holding back shipments because they get too little coal from Germany. The receipts on the Ruhr are reported to cover hardly 20 per cent of the demand. The works there are accordingly trying to adjust themselves to forms of production that enable them to dispense with minettes. They are turning more to Swedish and Spanish ores. New home sources are also coming into view on a small scale. A newly discovered deposit of brown iron ore in the vicinity of Giessen will be exploited soon. A new coal and ore field will also be opened at Luebbecke in Westphalia, where about 2,000,000 tons of coal and ore are ex-

pected to be mined yearly. The proportions of each are not mentioned.

In this connection it may be mentioned that, according to a report from Austria, the great ore mines in Styria can no longer be exploited and the last blast furnace there has been blown out because it is no longer possible to obtain coal and coke from Czechoslovakia. The Czechs have not only cut off Austria's coke supply but have latterly made sharp advances on iron and steel shipped to Austria.

Hardware Trade Suffering

The German cutlery and hardware trade continues in a bad way, and conditions are evidently growing worse. Consumers are holding back for lower prices; and further reductions are in fact regarded as unavoidable. The shops are largely working without orders and carrying the product to stock. The Solingen cutlery trade is reported as especially hard hit. The large establishments in that region that produce tools are still getting a few orders from South America, but from nowhere else. Considerable numbers of workmen have been discharged, and many shops are working only 24 hours a week. Orders for locks and other builders' hardware, both from home and abroad, are coming in very slowly, and many foreign orders have been called off. Large stocks have accumulated and manufacturers are expecting that they will be compelled to discharge many workmen soon. Prices are gradually falling, and iron and steel are being offered the shops in large amounts at reduced prices.

British Empire Steel Developments

At a meeting of the directors of the Dominion Steel Corporation, held in St. John, during the visit of inspection on the part of the board of Cape Breton properties of the corporation and those of the newly allied Nova Scotia Steel & Coal Co., two new directors were added to the board. The new members are D. H. McDougall, president Nova Scotia company, and Dr. W. L. McDougall, president Century Coal Co., Montreal. The development marks another step towards the consummation of the big steel-coal-shipbuilding consolidation, the British Empire Steel Corporation, and it is likely that there will be further developments in the near future interlocking the component parts of the consolidation. It is regarded as likely that Roy M. Wolvin, president Dominion Steel Corporation, and the prospective chief executive of the British Empire Steel Corporation, will shortly be elected to the board of the Nova Scotia Steel & Coal Co., thus further associating the two great steel and coal producers of the Dominion.

J. W. Norcross, president Canada Steamship Lines, Montreal, Que., according to present plans, will be chairman of the executive committee, which will be in charge of the entire undertaking of the merger, and also will serve as deputy chairman of the board of directors. He will retain the presidency of the Canada Steamship Lines, which will be leased to the British Empire Steel Corporation.

Shareholders of the Dominion Steel Corporation have signified their willingness to allow their company to become party to the steel and shipping merger known as the British Empire Steel Corporation by ratifying the agreement of their directorate with the promoters of the British Empire Steel Corporation, at a special meeting held in Halifax, N. S. The vote was unanimous in favor of the agreement, and there was no evidence of the discontent existing in the ranks of the directorate some weeks ago, which resulted in the supplanting of eight opposition members of the board by a similar number of new directors.

The consolidation includes the Dominion Steel Corporation, Nova Scotia Steel & Coal Co., the Canada Steamship Lines, Halifax Shipyards and several smaller companies. This merger, it is stated, will make the British Empire Steel Corporation the largest in-

dividual holder of iron ore and coal of any company in the world. Plans include the bringing into the consolidated companies of \$25,000,000 of new capital to be spent upon the development of properties.

The North Lebanon Foundry Co., Lebanon, Pa., makers of grey iron castings, whose president and treasurer, W. Benton Keller, was for many years sales manager of the Penn Seaboard Steel Corporation, has started production in the large extension to its plant, recently erected. Besides 10 power molding machines which have been installed the company will put on 25 more floor molders. A 58-in. Paxson cupola, with a melting capacity of 10 tons per hr. will take care of this output. The production comprises iron castings of all descriptions from one ounce to five tons in weight. Arthur Holmes is manager and Frank Cardwell superintendent.

The Atlas Crucible Steel Co., Dunkirk, N. Y., according to T. J. Dillon, president Dillon Crucible Alloys, Ltd., Welland, Ont., has acquired a substantial interest in the Welland business, which will in future be known as the Canadian Atlas Crucible Steel Co. The Canadian company has an authorized capital of 10,000 shares of 8 per cent cumulative preferred stock, par value \$100, and 10,000 common shares, no par value. Arthur H. Hunter, president of the American company, will become chairman of the board of directors of the Canadian company, and T. J. Dillon will remain as an officer active in the management of the business.

The newly organized International Chamber of Commerce is now under way in temporary headquarters at 33 rue Jean-Donjon, Paris, France. Dr. Edward Dolleans, professor of Political Economy at the University of Dijon, is temporary secretary-general.

The Cincinnati offices of Crocker Brothers, pig iron and alloy dealers, have been moved from the fifteenth floor to the seventeenth floor of the First National Bank Building. Herbert F. Topp, resident partner, is in charge of the Cincinnati district.

Wage Agreement for Bar Iron Mills

YOUNGSTOWN, Aug. 3.—As a consequence of agreement between the Western Bar Iron Association and the Amalgamated Association of Iron, Steel and Tin Workers on the 1920-21 contract, there will be no interruption of operations in affected mills. Agreement was reached at Columbus last week between representatives of both parties. The new contract contains a "memorandum of agreement" identical with that in the contract between the Amalgamated and the Western Sheet and Tinplate Manufacturers' Association. This memorandum embodies the organization policy of the Amalgamated association and was originally drawn up at the request of sheet manufacturers. Heretofore there has been no such clause in the contract between bar iron makers and their employees, acting through the union.

Two previous attempts to negotiate an agreement, one at Atlantic City and the other at Columbus, resulted in failure because of the insistence of the Amalgamated association upon an enlarged organization policy. Operations continued, however, under the terms of the old agreement, which provided that the men remain at work for 30 days from termination of the contract, June 30. At Atlantic City, the conference first devoted itself to a consideration of the wage scale, upon which it reached agreement, but disagreed over the "memorandum of agreement" provision. The Amalgamated presented the same memorandum which had been offered to the sheet manufacturers and then revised. The text of these two memorandums was published in THE IRON AGE, July 15, page 135.

Through the Amalgamated association, employees of bar mills asked for a 15 per cent increase on base rates and an additional 15 per cent increase on the 1.50 cent card rate and each succeeding card point up to 4-cent card.

The manufacturers agreed to an advance of approximately 10 per cent on a 1.50c. card rate, with the same differential for all higher rates, this arrangement applying to muck and puddle mills, bar and 12-in. mills, busheling on cinder bottom, busheling on sand bottom, knobbling, heating slabs, shingling and to piles on boards.

Employees in guide, 10-in., hoop and cotton mills were granted a 10 per cent increase at a 1.50c. card, and an additional 5 per cent advance on all sizes below base sizes until they get down to 5/16-in. rounds and sizes taking similar rates, when there is another 10 per cent advance.

James H. Nutt acted for the manufacturers at the final conference and President M. F. Tighe for the Amalgamated association.

The A. M. Byers Co., Pittsburgh, which is not a member of the Western Bar Iron Association, has signed a separate agreement with the Amalgamated on practically the same basis as that reached with the Western association. The Girard, Ohio, plant of the company closed for eight days following the termination of the old contract, June 30, because it contained no provision for the men to continue at work pending adjustment of a new agreement. A local understanding was finally reached between the men and the management, allowing operations to continue pending further negotiations. For some weeks a part of the puddle mill has been in operation at Girard. On Monday all of the puddle mill and the skelp mills resumed at normal rate.

Will Manufacture Trucks

The Boyden Steel Corporation has been incorporated under the laws of Maryland with \$100,000,000 capital stock. While the corporation is authorized to manufacture and deal in car trucks, vehicles, tractors, conveyances and railway appliances of every description, its principal business will be the manufacture of railroad trucks and other cars by which friction is reduced to a minimum. George A. Boyden is the inventor of the truck. The principal plant, it is said, will be erected in Baltimore.

The incorporators, besides Mr. Boyden, are Robert

Ramsay, Theodore G. Lurman, R. E. Lee Marshall and Janon Fisher of Baltimore, Ernest T. Trigg and Franklin S. Edmonds of Philadelphia, and John C. Frazer of Lansdowne, Pa. Others whose names are on the papers of incorporation are: B. Franklin Boyden, James B. Diggs, Edward F. Leiper, Leon J. Obermayer, John L. Clarkson and John C. Gilmour.

Sharp Advance in Refractories

PITTSBURGH, Aug. 2.—An advance of \$5 per 1000 in prices of fire clay and silica brick, effective to-day, is announced in a circular letter recently sent out by several manufacturers. This advance means that the iron and steel industry, which consumes about 95 per cent of the production of these grades of brick, will be called upon to pay more for supplies than it did during the war period, when it was possible to secure first quality Pennsylvania fire clay brick as low as \$45. The new minimum on this grade of brick is \$50 per 1000, f.o.b. works. Full effect of the advance will not be felt right off, for while most existing contracts were made upon a basis of price at time of delivery, some manufacturers have large stocks piled up waiting shipment, which were sold at a fixed price and of course cannot be billed at any advance over the figure named in the contract.

This advance is purely the result of transportation conditions and the scarcity of railroad facilities, particularly the latter. Lately, the supply of cars for shipments of refractories has not averaged much more than 25 per cent of normal requirements and with the exhaustion of storage space which has resulted, there has been a steady decline in plant operation. This has boosted producing costs sharply and so reduced the margin of profit that an advance was necessary. Makers of fire clay brick have their sheds full to capacity and barring early relief from the shortage of cars, must keep on curtailing production. Silica brick plants have not been running full for some time and accumulations of this grade are comparatively small. Shortage of magnesite is reflected in higher prices for brick made from that material.

Still higher costs appear to be immediately ahead as it is reported that a new list of extras is being compiled and the revision, it is said, will materially increase the premiums on other than standard shapes.

We quote per 1000 f.o.b. works:

	Fire Clay:	High Duty	Moderate Duty
Pennsylvania	\$50.00 to \$60.00	\$40.00 to \$55.00	
Ohio	47.00 to 55.00	35.00 to 40.00	
Illinois	50.00 to 55.00	40.00 to 45.00	
Kentucky	47.00 to 55.00		
Missouri	60.00 to 65.00	50.00 to 55.00	
<i>Silica Brick:</i>			
Pennsylvania	55.00 to 60.00		
Chicago	60.00 to 65.00		
Birmingham	56.00 to 61.00		
<i>Magnesite Brick:</i>			
Standard size, per net ton	100.00		
<i>Chrome Brick:</i>			
Standard size, per net ton	85.00 to 95.00		
<i>Bauxite Brick:</i>			
55 per cent per net ton	40.00 to 45.00		
76 per cent per net ton, base	90.00		

The recently acquired Schuylkill Haven, Pa., plant of the National Steel Rolling Co., 44 Cedar Street, New York, has been put into operation and is at present converting tonnages of shrapnel steel billets. The puddle mill in this plant is to be overhauled, according to present plans, and the 18-in. stands used in making a bar mill covering a full range of sizes. Rolling at present is done on a 10-in. mill. J. Harries Pritchard, formerly with Ford, Bacon & Davis and the Republic Iron & Steel Co. plant at Bessemer, Ala., has been appointed superintendent.

The Youngstown Sheet & Tube Co., Youngstown, is calling in its \$100 par value common stock for exchange for the newly authorized non-par value common on the basis of four shares of the new for one of the old. The new stock has sold on Youngstown and Cleveland exchanges at \$77 a share, which is the equivalent of \$308 for the old stock.

RELEASE 15,000 CARS FOR STEEL

Producers Secure Some Relief from Service Order No. 9

WASHINGTON, Aug. 3.—Through a modification of service order No. 9 applying to open-top cars, the Interstate Commerce Commission has given some measure of relief to the steel industry. The modified order as issued on July 29 makes it possible to divert for use in carrying steel products about 15,000 gondola cars which, under the original order, could be used only for coal. The modified order reads as follows:

Provided, that the phrase "coal cars" as used herein shall not include or embrace flat bottom gondola cars with sides less than 38 in. in height, inside measurement, or cars equipped with racks, or cars which on June 19, 1920, had been definitely retired from service for the transportation of coal and stenciled or tagged for other service.

The original order made the maximum height of the sides of gondola cars exempted from coal service 36 in. instead of 38 in. The modification of order No. 9 followed a hearing before Commissioner Aitchison on July 28 attended by a large number of traffic managers of steel companies. On their behalf J. F. Townsend, traffic manager National Tube Co., Pittsburgh, made a statement from which the following is taken:

Pittsburgh Congestion in Pipe

The change in the situation, so far as the National Tube Co.'s operations are concerned, since I appeared before the commission on July 10, or a little over two weeks ago, is that the large tube and pipe mills in the Pittsburgh district instead of resuming operations as we planned for July 19, continued closed down until last Monday, July 26, and less than 50 per cent of the mills have been able to resume. During the period that production was entirely suspended, the outbound shipments of piled material continued, but since the period referred to our company has only been able to reduce this quantity 6368 tons.

The transportation conditions and shortage of gondola cars is the only thing that has interfered with the production of wrought pipe and tubular goods, and you appreciate that the want of these products is interfering very seriously with the production of fuel, for 50 per cent of the wrought pipe and tubing is used for the production of oil and natural gas, 20 per cent for power and 30 per cent for domestic use—water, steam, gas and electricity.

On July 10 I referred to the iron ore dock at Lorain, Ohio, that is operated by the National Tube Co. and gave some figures in regard to the car supply, which I would now like to bring down to date. During the period for the month of June to midnight of July 24, we received only 39 per cent supply of open-top cars to handle ex-lake shipments of ore. During the period referred to, we loaded 5056 cars, and for the same period in the year 1918 we loaded 10,768 cars, indicating that the car supply was only 47 per cent this year as compared with the same period two years ago, or substantially the same percentage reported for the month of June, and I made the statement at that time that the open-top cars made empty at the Lake front we felt should be used to handle the ore, which in every case is loaded toward or directly into the coal mining districts in Pennsylvania, Ohio and West Virginia.

You, Mr. Aitchison, raised the question as to whether this was not being done, and when I stated that it was not in all cases, you asked me to give you the figures or to file a statement, which I will proceed to do now.

During the month of June and to July 24, inclusive, there were over 13,000 cars of coal dumped at the Baltimore & Ohio coal docks in Lorain, Ohio. Less than 3000 of these cars were loaded at the Baltimore & Ohio ore docks and less than 3000 loaded at the National dock, so that it is estimated that there were 7000 open-top cars moved empty during the month of June and up to July 24, or substantially the number of cars that the National Tube Co. was short at its dock for ore shipments, that in every case would have been loaded toward or directly into the coal mining districts of Pennsylvania, Ohio and West Virginia. . . . We have had repeated conferences with Mr. Griggs [manager ore and coal exchange, Cleveland], but the open-top cars are still moving away from the Lake front empty to a very large extent, as I have pointed out.

Steel Accumulation Increased

At the former hearing I gave a table showing the actual number of tons piled in the Pittsburgh, Johnstown, Buffalo, Cleveland, Lorain, Youngstown, Valleys, Wheeling, and

Middle Ohio Valley districts, and the quantity of iron and steel products piled in the mills, on platforms and in open yards has increased in the last two weeks in face of the large number of plants closed down and the curtailment in production, and a very careful estimate places the quantity on hand piled at 1,500,000 tons, or a sufficient quantity to load 30,000 cars. There are still over 20, blast furnaces idle in this section ready to be put in blast as soon as transportation conditions will warrant.

We feel, in view of service order No. 10, that really insures increased shipments of coal to the Lake front, that it would be in order for the commission to issue positive instructions that all open-top cars that are suitable for ore loading should be returned to the mining districts loaded with ore, and if the flat bottom, mill type gondolas can be returned to the service for which they were constructed, the accumulated steel products that the mills are choked with to-day will be entirely reduced before freezing weather, and unless some relief can be given the steel mills, by an adequate supply of this class of equipment, the accumulation will be on hand when Lake navigation closes and the car supply that is created at that time will be of very little avail, because the cancellation of orders will come with freezing weather, for a very large proportion of the steel products cannot be used in the North during the winter.

We are confident that if the open-top cars are ordered home from the West by your commission issuing positive instructions that they must be moved empty to the owning roads in the coal mining and steel district (similar to the instructions that were issued to send all box cars to the West empty) there will be sufficient coal cars to take care of the Lake coal trade, the same as there has been in the past, without using the mill type cars for the coal trade, and we trust that you will grant our earnest petition for relief.

One Reconsignment for Open Top Cars

WASHINGTON, Aug. 3.—As a means of further stimulating car movement and relieving the car shortage, the Interstate Commerce Commission has authorized the railroads to put in effect rules prohibiting more than one reconsignment of all freight in open top cars and coal and coke in all cars. Charges of from \$2 to \$5 per car are to be made for the single reconsignment permitted. Imposition of emergency penalty charges of \$10 a day on cars not unloaded during the usual free time under existing demurrage rules also is authorized by the commission. The railroads are given authority to file tariffs containing the new rules, effective on five days' notice. The reconsignment restriction is to remain in effect indefinitely. The emergency penalty charges for delays in unloading will remain in effect until Jan. 1921.

If the reconsignment order is received in time to permit instructions to be given to yard employees prior to the arrival of the shipment at billed destination or if such billed destination is served by a terminal yard then prior to arrival at the terminal yard a charge of \$2 per car will be made for this service. If the reconsignment order is received in time to permit instructions to be given to yard employees within twenty-four hours after the arrival of the car at destination, or if destination is served by a terminal yard then within twenty-four hours after arrival at such terminal yard, a charge of \$5 per car will be made for this service. When not reconsigned as above any order for reconsignment, diversion or reshipment will subject the freight traffic to the sum of local rates to and from points of reconsignment plus \$5 per car.

On all open top cars and on all cars loaded with coal or coke not released within the free time as prescribed in the national car demurrage rules, a storage charge of \$10 per day or fraction of a day will be made until the car is released.

Cleveland Wants Coal Order Modified

CLEVELAND, Aug. 2.—Cleveland dealers predict a serious shortage of coal next winter if order No. 10, giving priority for shipments of coal to Lake ports for points in the Northwest is carried out. The Cleveland Chamber of Commerce will send a committee to Washington this week to appear before the Interstate Commerce Commission asking that the order be modified. The decision of the chamber to act in the matter followed the passing of a resolution by the Retail Coal Dealers' Board declaring that it will be practically im-

possible to supply Cleveland with coal if order No. 10 is enforced. Dealers claim that they will be unable to supply anywhere near the city's requirements for next winter unless much of the coal needed is shipped before the close of the season of navigation.

Both manufacturers and domestic consumers would suffer from the shortage which is claimed will also affect many northern Ohio industrial plants. At present a small proportion of domestic consumers of Cleveland have been able to secure their coal supply for next winter, although many placed orders two or three months ago.

Coal Stocks and Output Decline

WASHINGTON, Aug. 3.—The Geological Survey finds that stocks of bituminous coal in the hands of railroads, industrial consumers, public utilities, and retail dealers on June 1 totaled 20,000,000 tons, which was the smallest amount at any time during the four years for which there are approximate records. The total is only about one-half the amounts on hand in the spring of 1919. The largest amount of coal held in stock by consumers at any time was on the day of the signing of the armistice in November, 1918, when the total was 63,000,000 tons. In the slackening of industrial activity in the five or six months following the armistice consumers drew on their supplies, stocks reaching low point in August, 1919. Later they rose in anticipation of the miners' strike of Nov. 1. They fell during the strike and rose again in January and February of this year. The present low point is due to the switchmen's strike.

The weekly figures of the Geological Survey on the production of bituminous coal show the effects of the strike of miners in Illinois and Indiana, to whom President Wilson has appealed to return to work. The total output of soft coal, including lignite and coal made into coke, during the week ended July 24, was 10,601,000 net tons, a decrease when compared with the preceding week of 329,000 tons, or 3 per cent. Production of beehive coke increased by 18,000 tons during the week ended July 24, but was slightly less than that obtained immediately before the July 4 holiday. The total output of the country as estimated was 381,000 net tons, as against 363,000 tons for the week ended July 17.

Technologic Paper No. 163, of the Bureau of Standards, entitled, "A Note on Stresses Caused by Cold-Rolling," discusses experimental data, showing that a given amount of reduction by rolling causes less residual stress in the metal rolled if it is brought about by a large number of light drafts than by a smaller number of heavy ones. This is shown by means of the curvature induced in each of a pair of superposed strips when they are simultaneously reduced in thickness by rolling, with varying reductions.

The result is attributed to the greater skin friction between the metal rolled and the face of the rolls with heavy than with light reductions. Because of this greater skin friction more of the reduction occurs through the backward forcing of the deeper-seated layers, and less through the elongation of the surface of the metal in contact with the rolls.

Beals, McCarthy & Rogers, Inc., Buffalo, recently bought the entire block bounded by Elk, Mackinaw, Fitzgerald and Katherine streets in that city. The property covers an area of more than four acres, with four frontages on the main line of the New York Central Railroad. The site contains a warehouse of concrete and brick construction and it is the intention of the company to build additions to more easily facilitate the handling of its business. The general offices of the company, as well as the hardware, tools, supplies and accessories departments, will remain at the old quarters at 40 to 62 The Terrace. The property purchased provides the company with much-needed space for the storing of the heavier lines of steel, iron and other products carried by the company. This firm is one of the oldest in Buffalo, having been founded in 1826.

COMPANY CARS

Property of Steel Manufacturers May Be Used for Hauling Coal

WASHINGTON, Aug. 3.—Steel manufacturers and other industrial concerns which purchased their own cars as a means of combating the traffic situation will run the risk of having them diverted for other purposes.

Officials of the Interstate Commerce Commission stated in response to an inquiry that private cars, when once put into service on a common carrier, are subject to orders of the commission. This means that an open-top car bought by a private company for use in transporting steel products would be diverted for coal use under the terms of the commission's service order now in effect limiting the use of open-top cars with specified exceptions to coal.

It was explained at the commission that as long as a company which owns a private car keeps it at its own plant or uses it for service within its own yards the commission has no authority over its movements. After the car, however, has been put into service on a common carrier and has reached its destination and been unloaded, the owning company has no assurance that it will get it back at once if such orders as are now outstanding are in effect.

The commission has given various rulings on the point at different times, notably in the case of oil tank cars. Oil companies owning cars have vainly sought to prevent their diversion under orders of the commission.

The question of privately owned coal cars is a matter of controversy in connection with the allotment of cars to the mines by the railroads. The Stone Branch Coal Co. has instituted proceedings before the Interstate Commerce Commission to cause a change in the practice by which private cars are not included in the total assigned to the mines.

The Stone Branch Coal Co., which operates two mines in Logan county, W. Va., on the Chesapeake & Ohio Railway Co. lines, states that there are a number of mines in that territory which own a considerable number of cars. These private cars so owned are especially assigned to the mines of the owners and are not taken into consideration in the general allotment of car supply of the railroad. The actual operation of this system, it is claimed, results in giving the owners of private cars 80 per cent of their coal mine capacity, while during the same period other mines in the territory receive only about 30 per cent of their requirements.

Contract for the entire piping requirements of the new boiler house at the Franklin works of the Cambria Steel Co., Johnstown, Pa., has been awarded B. Floersheim & Co., Farmers' Bank Building, Pittsburgh. This company also has the piping contract for the new steel works of the Weirton Steel Co., Weirton, W. Va., and for the blast furnace and boiler and power house for the Pittsburgh Crucible Steel Co., Midland, Pa. It has just completed a contract at LaBelle works of the Crucible Steel Co. of America, Pittsburgh, and has almost completed the piping installation at the boiler house and 15,000-kw. power station of the Carrie furnaces of the Carnegie Steel Co., at Rankin, Pa.

The Youngstown Pressed Steel Co. is moving from its old plant at Haselton station, Youngstown, to a new and modern property at Warren, Ohio, where it expects to begin operations about Sept. 1. The company specializes in pressed steel stampings for the automotive and agricultural implement industries. W. V. Galbreath is president. The company's old property will be utilized by the Sharon Steel Hoop Co.

The Barber-Greene Co., manufacturer of belt conveyors and bucket loaders, Aurora, Ill., is in the market for bending rolls, second-hand, belt driven, capacity not over $\frac{1}{2}$ in. and not less than No. 12 gage, rolls about 6 ft. long.

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Higher Freight Rates and Prices

The order of the Interstate Commerce Commission authorizing advances in railroad freight rates is an act of long-delayed justice. It has taken an amazing time for the nation to decide to end the war on the railroads—for the policy of crippling and starving is fairly comparable with the bombardment and siege of war; and now time likewise will be a large factor in the process of recovery. Compared with the beggarly rate of equipment buying in the past two years that of the next year may look large; but the marks of years of credit impairment will long remain.

An estimate by the Bureau of Railway Economics puts at \$1,580,000,000 the total additional revenue, both interstate and intrastate, to be derived from the new rates. This includes approximately \$1,300,000,000 from freight traffic and \$283,000,000 from passenger traffic. It is estimated that the advances represent an average increase of 35½ per cent for the entire country. The total is intrinsically large, but not when compared with the vastly increased outlays of the railroads. Wages alone on the present scale represent an outlay of roundly \$4,000,000,000 per year.

The question is asked and is being widely discussed: To what extent will the increase in transportation charges be added to the prices consumers now pay for commodities? The answers are various and must be so. The statement is put out on one authority and another that transportation rates are scarcely felt in the cost of living of the average person. Again we are told that the prices of various commodities will be advanced because of the increased freight rates, and there is even the warning that manufacturers and dealers will add more than the increase in transportation, just as sellers have been charged with pyramiding excess profits taxes in the prices of their products.

Undoubtedly in many cases the increased freight will be absorbed by the producer. In other cases it will be absorbed by the jobber and the retailer. On a trainload of hides, for example, the increase will represent a very large sum, as

will be the case also on a trainload of shoes; but on a single pair of shoes it will be negligible. In iron and steel the increased freight rates will probably represent an addition of \$1.50 to \$3 per ton to present costs, the exact amount depending on location of plant with reference to raw material supplies. The public need not be greatly concerned about the increase in iron and steel freight rates. The principal buyers of the products of iron and steel works are manufacturers who convert iron and steel as they come from the producers' works into machinery and the thousand and one products of foundries, machine shops and other metal-working plants. The manufacturing buyers of rolling-mill products will pay the increased freights rather than the producers, since these products are sold f.o.b., mill. The same is true in the case of pig iron, the selling price being for the iron at the furnace.

It is to be considered in connection with increased railroad charges for carrying iron and steel, that the railroads are normally buyers of from one-fourth to one-third of the product of the country's steel works. Therefore, if in the years just ahead railroad buying of steel is on a scale compensating for the abstemious buying of the years last past, the railroads themselves will bear a considerable part of any advance in steel prices that may be due to higher transportation charges.

It will not be easy to trace the effect of the freight rate advance upon the steel market or upon other markets, for the reason that other influences are now at work tending to lower the prices of important commodities. In flour, in textiles, in leather, rubber and building materials the readjustment is under way and there is little question of its extension to other lines. The great yields of grain and cotton this year and the effect already seen in those markets are indicative of what is ahead. And since labor's poor performance has been responsible for a part of the advance in manufactured products, the increased outputs per man of which there is accumulating testimony from many quarters should soon be

heard from to a corresponding degree in the downward readjustment.

Iron and steel, being subject to a number of influences of their own, have been exempt thus far apparently from the tendencies plainly observed in other fields. Their failure to function as the barometer forecasting the revision of prices now in process in other lines of trade has been a matter of general comment. Under such circumstances the effect of the advance in freight rates on iron and steel prices would have less than ordinary interest for other trades. Moreover, it could have little present significance, for the steel trade itself, seeing that the prices of the Steel Corporation and those of most of the independent steel companies are from \$10 to \$30 per ton apart, a variance about ten times as great as the range of increase in steel making costs due to the new freight rates.

For Unionism and Reaction

In our comment of last week on the steel strike report of the Interchurch World Movement's commission, reference was made to its obvious bias against the iron and steel industry, and against the United States Steel Corporation in particular. It is hardly necessary to refer to the fact that the Interchurch World Movement has been repudiated by many who at first were disposed to give it support. It spent money with reckless extravagance and for purposes that were never thought of by many who contributed largely to it, and the suggestion is now made that the steel strike report has been "played up" in an effort to show where some of the money went. The report itself claims that it is worth a good part of the money that was subscribed for the whole movement.

There has been a natural feeling of indignation in the trade that a commission without adequate knowledge of industrial and labor conditions in general should undertake to "investigate" the iron and steel strike, for obviously such a thing must be taken in its proper relations.

The report tacitly if not openly assumes that the existence of labor unions in the iron and steel industry is essential. That is an absolutely false start. The history of industrial America furnishes no basis for any such assumption. Industrially we are non-union or open shop, not union. Of the workers of various classes in the United States approximately 10 per cent are union and approximately 90 per cent are non-union; but if the proportion of unionism were 20 per cent, which would be far beyond the mark, unionism would still be in a small minority.

The assumption of unionism as a basis is shown in various ways in the report. In the "recommendations" the manufacturers are called upon to recognize the right of collective bargaining. "Organized labor" is called upon to make certain changes, apparently for the purpose of making it less distasteful to the public; but had the commission investigated unionism it should have been able to ascertain that the recommendations would fall upon barren soil. Finally, the President's industrial conference plan is commended for trial

as means for meeting a "strike situation" when ordinarily a "strike situation" presupposes a union.

Unionism must be taken as it is found. The interchurch commission cannot whitewash unionism by making specious remarks about what "organized labor" should do to reform itself, though this part of the report may appeal to the uninitiated—or verdant. The iron and steel industry requires co-operation between employer and employed. That is not the spirit of unionism, which is rather one of conducting a contest. Some unions impose fines upon their members for co-operating with their employers and union leaders have opposed every plan that would lead to a better understanding, since their trade thrives on misunderstanding, and the creation and keeping alive of antagonisms. The greatest danger to industry to-day is from autocratic control by labor unions. Employers have learned faster than the union leaders. It has even come to pass that conditions under many an open shop regime have been better for the workmen than those prescribed by the rules of closed shop unionism. We believe there are enough forward-looking men in responsible positions in the industry to make this the fact in respect to iron and steel works operations. In view of what already has been accomplished without union domination, the proposal of the Interchurch Movement's commission to hand the industry over to militant unionism has in it more possibilities of reaction than of progress and the largest ultimate good to the worker. Nothing has been more marked in the union program as interpreted by recent events than restriction of output and hostility to all plans for conciliation and co-operation.

Construction and Earnings

A feature of the general economic situation that makes for sound conditions in the future is that there is no danger of construction work being carried to excess. A theory accepted in many quarters is that industrial depressions are produced largely by there being an unwarranted amount of construction work. Capital is found to be tied up in unproductive enterprises. Its failure to produce returns causes hardship to those interested and creates a feeling of uncertainty. Business has been trained to depend upon construction work for a considerable part of its orders, and when this patronage is withdrawn business suffers. Workmen who had been engaged on construction work are thrown out of employment and cannot secure jobs elsewhere.

At the present time it is notorious that construction costs are very high, even by comparison with the cost of doing many other things than building, so that it seems quite safe to assume that no capital is going to be locked up in construction work unless there are very strong assurances that the structure, whatever it may be, will find employment and earn money. The chance that when building costs are high they may decline furnishes no suggestion that depression will result later from there being a decline. The

theory of industrial depressions just referred to does not relate to paper losses sustained by investors through the cost of duplication being reduced. It is a matter of whether the thing built will find employment. The fact that after two years or four years it could be duplicated for less money than it cost would not cause it to become idle while another thing of the same sort were built at the lower cost and operated. On the contrary, if a decline occurred in building costs, building would be stimulated.

Instead of the danger that the next one, two or three years will see too much construction work, more than the normal requirements of the country can use continuously, we have now only the danger that in some directions there has already been more construction than is necessary. If that is the case, the effect would be felt now rather than at some later time. Perhaps a few of the war activities did result in more construction than is needed for after-war conditions but if so we do not feel any adverse effects, and such effects would have been manifest before this time.

Apart from the deterrent of building costs being high, there is the influence that interest rates are high. A period of overconstruction is always marked by low interest rates, according to those who hold to the doctrine that an excess of permanent construction brings about an industrial depression. Lately there has been a coterie arguing that interest rates are not high, on account of alleged "new conditions" but that as everything else has gone up, so interest rates must advance also. By this reasoning the present interest rates might be held to be low compared with what is coming. There is a fundamental fallacy in that whole argument about interest rates, however, the fallacy being that rates per cent are compared with commodity prices and wage rates expressed in dollars. The things are not comparable. There is good reason, therefore, to conclude that the country is safe from having a period of over-expansion.

The effect of the war on the wages of the unskilled laborer is strikingly illustrated by conditions in England. The wage earner there known as the builder's laborer was paid, only a few years ago, 4½ pence per hour or about 9 cents. He was at the bottom of the scale of labor. By a recent agreement he is to be paid two shillings an hour for a week of 47 hours—an increase of nearly 450 per cent. To-day he is at the top of the scale and is characterized by one British trade paper as the "plutocrat of the hod." This increase means, to men working in iron and steel plants in building and repairing furnaces (these being entitled to an extra 2 pence per hour) a wage of £5 1s. 10d., or about \$24.64 at normal exchange. The significance of these wages lies not only in the example they afford of the cost of production in the British steel industry but also in being decidedly above the wages of the more skilled and competent workers, such as chemists, draughtsmen and pattern makers. Such a condition is sure to breed and is causing dissatisfaction among the skilled craftsmen. It is a commentary on the present unjust economic conditions that skilled and edu-

cated employees could earn more by abandoning their regular work and "carrying a hod."

British Export Steel Trade Expands

The British foreign steel movement for the first half of this year is analyzed elsewhere in this issue. While the June exports did not quite equal the rate in May and March, they bring the total for the six months to 65 per cent of the record exports of 1913 and to 50 per cent more than the movement for the first half of 1919. A significant development is the marked increase in imports of steel and iron, particularly in June. The June imports of 131,476 tons exceed those for any other two months this year and compare with an average of 195,264 tons per month in 1913. The imports thus far this year are more than double those for the first half of 1919, or 509,500 tons compared with 224,900 tons. This showing is remarkable in view of industrial and economic conditions in England. With prices at record heights and in excess of our own, the expansion in exports shows the great need of the world for iron and steel.

While an early drop in British prices is looked for, there is slight evidence yet of such a development. As long as production costs remain where they are, any decided decline either in Great Britain or in any other country is improbable. Illustrative of some of the inequalities, British beams are selling at £25 per ton while sheet bars were bringing £26 to £30 until a week or more ago.

The most important increase in British exports has been in galvanized sheets. For the first half of the year the total was 223,600 tons, or five times that for the like period in 1919. Another interesting item is the importation of pig iron. In 1913 these imports were one-tenth of the total but for the first half of this year they were one-quarter of the total and nearly equal to the total pig-iron importations in all of 1913.

While the general results are satisfactory to the British steel trade, there is no doubt that the volume of exports this year would have been larger had British labor and transportation conditions been better. As it is, American competition has made considerable inroads on trade formerly regarded as securely British, and in that respect the situation is not reassuring. One British paper goes so far as to say that there are indications that some markets which thus far it has been impossible to regain are permanently lost.

The United Engineering & Foundry Co. has paid its third quarterly dividend this year of 6 per cent on \$4,617,700 outstanding common stock. In addition, the company disbursed the regular preferred dividend for the third quarter at the annual rate of 7 per cent. Headquarters are in Pittsburgh.

The plant of the Murphy Foundry Co., Beaver Falls, Pa., was practically entirely destroyed by fire on July 20. The loss is estimated at \$50,000. It is the intention of the company to immediately begin work of rebuilding.

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Year's Steel Exports Under Billion Dollars

Valuation and Tonnage Figures Show Slump—Few Items Increase—Machinery Exports Drop \$7,000,000 Under May Figure—Imports Steadily Climb

WASHINGTON, Aug. 3.—For the first time since 1916, a year's exports of iron and steel products have dropped below the billion-dollar mark. The Department of Commerce has completed its preliminary estimate of exports for the fiscal year ended June 30, 1920. They showed an outgo of manufactures of iron and steel totaling \$932,675,866. For the fiscal year ended June, 1919, these figures aggregated \$1,065,021,193; for 1918 they were \$1,125,889,371; for 1917, \$1,133,746,188, and for 1916—the highest up to that time—\$624,087,940.

The tonnage figures for the fiscal year showed the same slump. For the twelve months ended June 30, 1920, the exports of iron and steel aggregated 4,212,732 gross tons; for the year 1919 they were 5,181,951 tons; for 1917, 6,885,543, and for 1916, 4,862,154. The 1916

total was 17,075 tons against 13,032 tons in May, 1920, and 39,758 tons in June, 1919.

The exportation of steel rails dropped to 553,860 tons in the fiscal year, 1920, against 621,728 in the fiscal year 1919. The June, 1920, outgo for this commodity was 49,620 tons, against 58,497 tons in May, 1920, and 67,028 tons in June, 1919. It is interesting to note the

Exports of Iron and Steel—Gross Tons

	June		Fiscal Year	
	1919	1920	1919	1920
	Gross Tons	Gross Tons	Gross Tons	Gross Tons
Ferromanganese	130	275	2,184	2,374
Ferrosilicon	88	31	4,949	398
All other pig iron	39,540	16,799	335,279	245,354
Scrap	1,843	24,153	5,428	81,464
Bar iron	3,088	3,268	81,788	36,530
Wire rods	13,904	15,134	26,902	111,823
Steel bars	91,155	53,559	529,717	583,418
Billets, ingots and blooms, n.e.s.	46,016	29,811	911,695	288,766
Bolts and nuts	4,488	3,061	64,252	34,910
Hoops and bands	5,724	3,488	56,553	45,188
Horseshoes	220	250	2,498	2,567
Cut nails	172	212	3,468	4,002
Wire nails	11,440	7,808	93,898	55,681
All other nails including tacks	2,276	1,663	18,406	9,745
Cast iron pipes and fittings	4,737	3,764	40,042	46,415
Wrought iron pipes and fittings	36,421	17,654	173,252	221,064
Radiators and cast-iron house-heating boilers	407	338	3,577	6,745
Railroad spikes	4,343	1,631	20,749	17,190
Steel rails	67,028	49,620	621,728	553,860
Galvanized iron sheets and plates	14,345	10,454	86,113	99,313
All other iron sheets and plates	5,504	3,049	222,547	33,354
Steel plates	76,763	61,555	746,532	721,828
Steel sheets	20,954	15,383	160,432	151,324
Ship and tank plates punched and shaped	1,732	1,112	20,598	26,926
Structural iron and steel	49,842	34,669	340,584	339,908
Tin and terne plates	19,660	18,604	244,302	207,296
Barb wire	10,932	8,109	197,392	118,878
All other wire	9,908	17,253	167,086	166,411
	544,580	402,707	5,181,951	4,212,732

tonnage figures were greater than those for 1920, but so great has been the increase in values that the 1920 exports were worth 50 per cent more than the outgo for 1916.

The figures for June are in keeping with this downward tendency. In some cases they are even more pronounced in their record of reduction. The exports of manufactures of iron and steel in June, 1920, aggregated \$88,844,831, a drop of more than 25 per cent from the \$121,036,322 recorded for June, 1919; and approximately 10 per cent from the \$99,061,058 exported in May, 1920.

The June, 1920, tonnage figures showed the same slump. The exports of iron and steel aggregated in that month 402,707 tons, against 420,359 in May, 1920, and 544,580 tons in June, 1919. The chief drop for the fiscal year figure is represented by a decrease in exports of billets, ingots and blooms from 911,695 tons in 1919 to 288,766 in 1920. The June, 1920, export of this item was 29,811 tons, against 46,016 tons in June, 1919; and 16,370 in May, 1920.

The exportations of all forms of pig iron in the fiscal year 1920 aggregated 248,126 tons, against 342,412 tons for the preceding fiscal year. The June, 1920,

fluctuations in the destinations of rails, as revealed by the yearly figures. In the fiscal year 1919 Japan received 70,763 tons, but in 1920 it went to the head of the list with a total of 202,268 tons. Cuba received 43,571 tons in 1919 and 88,392 in 1920; France, 234,582 tons in 1919 and 20,548 in 1920; Brazil, 3,005 in 1919 and 27,053 in 1920; Dutch East Indies, 12,216 in 1919 and 29,501 in 1920; the Philippines, 6,082 in 1919 and 24,016 in 1920; British South Africa, 11,580 in 1919 and 30,353 in 1920.

In a few items there were increases in the yearly figures. The chief of these was an increase from 26,902 gross tons of wire rods in the year 1919 to

Exports, January, 1919, to June, 1920

	Gross Tons	All Iron and Steel	Pig Iron	Semi-finished Material
January, 1919	360,456	35,793	11,594	
February	234,793	20,178	10,407	
March	344,506	22,054	8,176	
April	408,204	16,300	11,488	
May	447,050	32,233	20,771	
June	544,580	39,540	46,016	
July	287,823	38,373	21,318	
August	396,743	36,071	36,162	
September	363,505	18,991	37,513	
October	302,456	14,108	20,713	
November	295,045	21,429	13,211	
December	254,676	14,612	21,538	
Total	4,239,837	309,682	258,907	
January, 1920	333,601	18,468	19,937	
February	308,185	15,739	22,693	
March	417,216	22,740	30,444	
April	395,120	14,608	19,632	
May	420,359	13,032	16,370	
June	402,707	17,075	29,811	

111,823 tons for the fiscal year 1920; galvanized iron sheets and plates rose from 86,113 tons in 1919 to 99,313 tons in 1920. Ship and tank plates increased from 20,598 in 1919 to 26,926 in 1920.

The decrease in valuation figures for the year covered a wide range of commodities. In the exports of ingots, billets and blooms there was a reduction of approximately \$60,000,000 in 1920 as against those of 1919. Sheets and plates dropped approximately \$29,000,000; wire and manufactures of wire, \$17,000,000; steel rods and bars, \$12,000,000; rails, \$5,000,000; pig iron, \$4,000,000, and structural iron and steel, \$3,000,000.

The exports of pipes and fittings increased a round \$4,000,000, but the chief increase of the year was that

Exports of Machinery	June 1919	June 1920	Fiscal Year 1919	Fiscal Year 1920
Adding machines	\$415,386	\$523,962	\$3,417,958	\$4,325,104
Air compressing machinery	575,870	407,016	3,668,688	4,371,107
Brewers' machinery	30,675	44,274	177,442	334,028
Cash registers	297,993	413,560	2,292,306	5,551,993
Parts of	46,885	74,561	203,243	402,821
Concrete mixers	18,606	55,462	245,708	516,949
Cotton gins	16,310	37,651	290,969	302,266
Cream separators	160,261	127,841	1,033,315	1,133,068
Elevators and elevator machinery	516,106	140,136	3,405,909	1,976,279
Electric locomotives	12,489	327,947	1,484,157	
Gas engines, stationary	81,367	50,876	582,511	803,151
Gasoline engines	3,228,865	2,965,458	33,399,961	33,190,177
Kerosene engines	763,428	1,026,138	9,082,605	8,543,699
Steam engines	892,161	337,687	29,430,326	46,381,621
All other engines	618,653	315,533	5,477,668	5,387,579
Boilers	1,362,770	477,373	3,844,071	6,358,175
Boiler tubes	4,823,600	1,783,935	9,472,284	4,459,253
All other parts of engines	138,445	158,792	28,695,085	21,783,421
Excavating machinery	481,076	117,965	1,097,932	1,441,857
Milling machinery, flour, grist	88,948	73,950	2,301,999	1,639,948
Laundry machinery, power	48,946	77,778	517,563	1,105,118
All other	95,539	34,566	362,100	519,917
Lawn mowers	1,712,899	846,583	10,127,766	8,915,519
Lathes	1,209,067	1,127,297	12,837,464	12,050,721
Other machine tools	555,113	395,963	6,144,229	4,371,978
Sharpening and grinding machines	5,129,486	1,134,940	29,418,758	22,780,373
All other metal working machinery	96,690	57,149	671,871	
Meters, gas and water	337,634	419,235	3,597,029	4,195,119
Mining machinery, oil well	1,078,802	376,508	9,562,751	8,243,634
All other	852,784	185,449	3,191,442	2,656,274
Paper mill machinery	418,512	700,111	2,654,001	6,283,729
Printing presses	1,092,261	1,130,687	7,484,606	10,617,940
Pumps and pumping machinery	216,182	245,045	2,101,851	2,422,789
Refrigerating and ice-making machinery	156,520	150,952	306,123	1,207,000
Road-making machinery	263,931	160,067	2,053,540	2,628,857
Sewing machines	745,311	1,010,080	10,132,593	1,547,518
Sugar-mill machinery	1,792,839	2,395,800	11,492,052	16,378,115
Textile machinery	399,289	297,022	3,233,783	3,875,947
Typesetting machines	1,888,022	2,478,623	11,988,363	23,012,903
Typewriting machines	137,580	145,228	974,442	1,419,758
Windmills	134,860	78,218	1,531,574	922,838
Wood-working machinery, saw mill	433,089	254,520	1,761,205	3,319,529
All other	8,998,694	7,969,719	60,190,557	79,981,888
All other machinery and parts of	\$419,639	\$36,501,051	\$346,009,973	\$397,404,999

of machinery, the exports of which rose approximately more than \$51,000,000. This increase in machinery exports was recorded despite the decrease in the June figures. For the fiscal year 1920 the total outgo of machinery was \$397,404,999; in 1919 the total was \$346,009,973. The June, 1920, figures, however, totaled only \$36,501,051 against \$43,512,416 in May, 1920, and \$46,419,639 in June, 1919.

Although the figures for the fiscal year for the various items of machinery show a general increase in the majority of lines, they are at distinct variance with the figures for June. The \$10,000,000 slump there as compared with the June, 1919, figure and \$7,000,000 from the May, 1920, figure is spread over a long list of items. In fact, only a few showed a real increase in June, 1920, over the figures for June, 1919, and for May, 1920.

Textile machinery exports showed a total of \$2,395,800 in June, 1920, against \$1,765,196 in May, 1919; sugar mill machinery totaled \$1,010,080 in June, 1920,

against \$925,740 in May, 1920, and \$745,311 in June, 1919. Steam engines totaled \$4,509,466 in June, 1920, against \$2,839,216 in June, 1919, but the May, 1920, figure for this item was \$6,172,915.

The import figures continue to show a steady increase both as to tonnage and value. Imports of the various products of iron and steel in June, 1920, aggregated \$5,268,126 against \$1,590,488 in June, 1919; and \$3,714,782 in May, 1920. For the fiscal year 1920 these imports aggregated \$37,423,289, against \$24,306,839 in the fiscal year 1919. The tonnage figures showed an importation of 40,554 gross tons in June, 1920, against 34,976 in May, 1920; and 21,204 tons in June, 1919. For the fiscal year of 1920, the tonnage of these imports was 439,803 tons, against 191,352 tons in the year 1919.

Importations of manganese ore continue on a high level. The June, 1920, figure was 80,329 gross tons against 56,586 tons for May, 1920; 35,088 in April, 1920; and 31,550 tons in June, 1919.

O. F. S.

Demonstration of Rust-Prevention

A rust-preventing compound, for which the trade name Stazon has been selected, was demonstrated recently before a group of editors of technical publications by H. C. Wilson of the Conversion Products Corporation, 149 Broadway, New York. Mr. Wilson and W. H. Buell, who for many years have been connected with rifle manufacturing companies, have conducted experiments to perfect a preparation that would protect ferrous metal products from rust and at the same time provide a coating impervious to the action of moisture, atmospheric fumes and summer heat. During the war Mr. Wilson directed the shipments of large quantities of arms, many of which were ruined by rust before they reached the soldiers. Stazon, it is claimed, is especially valuable for the protection of parts in process of manufacture, where such parts must be stored for further operations or assembly, and for tools, gages, fixtures and for all kinds of machinery which must be kept in stock either on open shelves or boxed awaiting shipment. In the demonstration Mr. Wilson made he showed that the compound he and Mr. Buell have discovered will stand a temperature of

about 200 deg. before melting. A manufacturing plant has been obtained by the company and its product is now being placed on the market.

Training Recruits for Bridge Shop

To train recruits for its shop force, the Federal Bridge & Structural Co., Waukesha, Wis., has established a course of instruction in bridge shop work and practice under the supervision of M. W. Dunlap, chief engineer. Forty-seven men have enrolled in the first class, which meets two evenings a week. The Federal company, like most other industries, has suffered much from lack of common and skilled labor. Being the only structural shop in Waukesha, it has no local field from which to draw a supply of skilled mechanics. Consequently it has been found necessary to take special measures to train men, particularly workers who have been in its employ for years, but through lack of experience are not able to take skilled work positions. The educational feature now instituted is part of a general welfare program based upon the establishment some time ago of a shop council.

PIG IRON OUTPUT IN JULY

Production 24,000 Tons Heavier Than in June but Less Per Day

Net Loss of Nine Furnaces—Largest Ferromanganese Output of the Year

The July production of pig iron may be said to have lost 50 per cent of the recovery established in June, the daily rate having declined about 2500 tons from that in June. The abnormal transportation conditions as well as the car priority orders and the Illinois coal strike are the causes.

The production of coke and anthracite blast furnaces in July, a 31-day month, amounted to 3,059,603 gross tons or an average of 98,937 tons per day, as compared with 3,043,540 tons or 101,451 tons per day in June, a 30-day month, and with 2,985,682 tons or 96,312 per day in May, a 31-day month. It compares with 2,739,797 tons or 91,327 tons per day in April, a 30-day month, the period when the railroad strike was at its height.

A new record for the year was made in the production of manganese alloys, the July total having been 36,789 tons. Of this total 29,864 tons was ferromanganese and 6925 tons was spiegeleisen. The ferromanganese output was also the largest for the year.

Daily Rate of Production

The daily rate of production of coke and anthracite pig iron by months, from July, 1919, is as follows:

Daily Rate of Pig Iron Production by Months—Gross Tons			
	Steel Works	Merchant	Total
July, 1919	61,503	16,837	78,340
August	68,018	20,478	88,496
September	60,954	21,978	82,932
October	41,796	18,319	60,115
November	57,589	22,156	79,745
December	61,815	23,129	84,944
January, 1920	72,015	25,249	97,264
February	75,230	27,490	102,720
March	80,021	28,879	108,900
April	65,168	26,159	91,327
May	68,668	27,644	96,312
June	73,659	27,792	101,451
July	71,954	26,983	98,937

The figures for daily average production, beginning with January, 1914, are as follows:

Daily Average Production of Coke and Anthracite Pig Iron in the United States by Months Since Jan. 1, 1914—Gross Tons							
	1914	1915	1916	1917	1918	1919	
Jan.	60,808	51,659	102,746	101,643	77,799	106,525	97,264
Feb.	67,453	59,813	106,456	94,473	82,835	105,006	102,720
Mar.	75,738	66,575	107,667	104,882	103,648	99,685	108,900
Apr.	75,655	70,550	107,592	111,165	109,607	82,607	91,327
May	67,506	73,015	108,422	110,238	111,175	68,002	96,312
June	63,916	79,361	107,053	109,002	110,793	70,495	101,451
July	63,150	82,691	104,017	107,820	110,354	78,340	98,937
Aug.	64,363	89,666	103,346	104,772	109,341	88,496	....
Sept.	62,753	95,085	106,745	104,465	113,942	82,932	....
Oct.	57,361	100,822	113,189	106,550	112,482	60,115	....
Nov.	50,611	101,244	110,394	106,859	111,802	79,745	....
Dec.	48,896	103,333	102,537	92,997	110,762	84,944	....

Production of Steel Companies

Returns from all furnaces of the United States Steel Corporation and the various independent steel companies, as well as from merchant furnaces producing ferromanganese and spiegeleisen, show the following totals of steelmaking iron, month by month, together with ferromanganese and spiegeleisen. These last, while stated separately, are also included in the columns of "total production."

Production of Steel Companies—Gross Tons

	Total production			Spiegeleisen and ferromanganese		
	1918	1919	1920	1918	1919	1920
Jan.	1,756,208	2,430,022	2,232,455	30,695	32,787	23,957
Feb.	1,620,254	2,209,470	2,181,679	26,114	28,105	28,038
Mar.	2,349,419	2,277,507	2,480,668	39,122	26,644	35,275
Apr.	2,411,488	1,838,677	1,968,542	35,511	17,308	27,628
May	2,513,577	1,586,806	2,128,720	54,633	14,604	33,407
June	2,407,166	1,655,944	2,209,770	44,844	14,254	34,751
July	2,456,693	1,906,604	2,230,567	51,762	14,805	36,789
Aug.	2,509,357	2,108,566	....	54,009	17,419	....
Sept.	2,507,381	1,828,613	....	66,275	20,631	....
Oct.	2,594,277	1,295,690	....	70,379	20,238	....
Nov.	2,501,867	1,727,656	....	59,638	19,964	....
Dec.	2,524,794	1,916,249	....	49,435	15,718	....

Output by Districts

The accompanying table gives the production of all coke and anthracite furnaces for July, and the three months preceding:

	Pig Iron Production by Districts—Gross Tons			
	July (31 days)	June (30 days)	May (31 days)	Apr. (30 days)
New York	212,392	221,067	220,820	175,708
New Jersey	3,764	7,494	9,366	6,181
Lehigh Valley	87,622	80,680	89,699	82,046
Schuylkill Valley	76,614	82,232	97,013	83,617
Lower Susquehanna and Lebannon Valleys	57,863	63,810	68,340	60,505
Pittsburgh district	637,773	664,345	652,940	641,159
Shenango Valley	97,708	93,975	62,297	74,054
Western Pennsylvania	177,866	165,907	184,541	181,446
Maryland, Virginia and Kentucky	99,850	103,219	114,765	106,914
Wheeling district	108,304	116,967	119,015	105,191
Mahoning Valley	297,462	267,816	177,685	163,496
Central and Northern Ohio	304,149	288,789	287,544	272,896
Southern Ohio	55,293	65,547	74,078	65,922
Chicago district	488,790	472,609	477,878	388,963
Mich., Minn., Mo., Wis., Colo., and Wash.	119,629	116,552	111,760	97,488
Alabama	218,227	209,087	212,124	191,389
Tennessee	23,737	23,444	25,817	24,722
Total	3,067,043	3,043,540	2,985,682	2,739,797

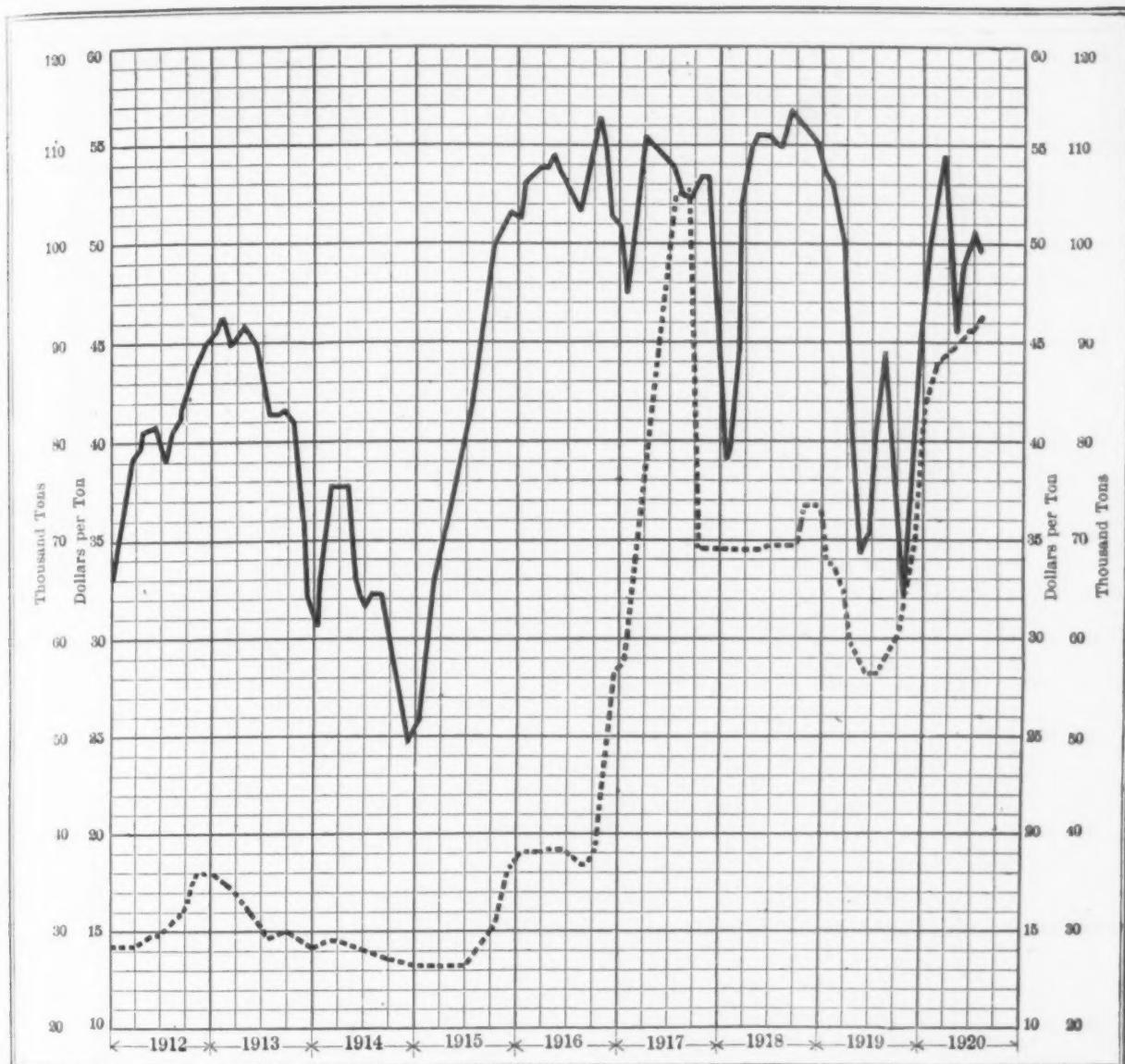
Capacities in Blast Aug. 1

The following table shows the number of furnaces in blast Aug. 1 in the different districts and their capacity, also the number and daily capacity in gross tons of furnaces in blast July 1:

Location of Furnaces.	Total stacks	Coke and Anthracite Furnaces in Blast	
		Aug. 1	July 1
New York:			
Buffalo	12	19	7,150
Other New York	4	3	125
New Jersey	4	1	160
Pennsylvania:			
Lehigh Valley	18	12	2,510
Spiegeleisen	2	180	270
Schuylkill Valley	14	9	2,740
Lower Susquehanna	8	4	1,300
Ferro and Spiegel	2	65	55
Lebanon Valley	9	565	375
Ferro	1	205	195
Pittsburgh District	53	45	21,635
Ferro	5	505	510
Shenango Valley	27	10	3,130
Western Penn.	27	18	5,530
Maryland	6	5	1,490
Wheeling District	15	8	3,900
Ohio:			
Mahoning Valley	27	22	9,600
Central & North	26	23	9,625
Southern	16	12	2,285
Illinois and Indiana	40	25	15,930
Ferro	1	75	70
Mich., Wis. and Minn.	14	8	2,745
Col., Mo. and Wash.	8	4	1,130
The South:			
Virginia	17	8	995
Ferro	1	60	80
Kentucky	7	5	810
Alabama	45	27	6,970
Tennessee	17	8	650
Total	437	293	101,500
		93,965	302

The furnaces blown in include the Genesee furnace in New York, two Bethlehem furnaces in the Lehigh Valley, the Vesta furnace in the lower Susquehanna Valley on manganese alloys, one Bethlehem Steel Co's furnace and the Robesonia furnace, in the Lebanon Valley, Ella furnace, in the Shenango Valley, one Josephine furnace in Western Pennsylvania, one River furnace in central Ohio, the Milton and Union furnaces in Southern Ohio and the Lafollette furnace in Tennessee.

Among the furnaces blown out or banked are the Crumwold furnace, in the Lehigh Valley, the Brooke and one Swede furnace, in the Schuylkill Valley, one Carrie and one Duquesne furnace of the Carnegie Steel Co. and one Monongahela furnace of the National Tube Co., in the Pittsburgh district, the Sharpsville furnace in the Shenango Valley, the Marshall furnace in West-



The Full Line Represents the Daily Production of Pig Iron and the Dotted Line Is the Average of the Price Per Ton of No. 2 Southern Pig Iron at Cincinnati, Local No. 2 Iron at Chicago and No. 2X Iron at Philadelphia

ern Pennsylvania, and one furnace of the Maryland Steel Co., in Maryland; Nos. 2 and 4 Mingo furnaces of the Carnegie Steel Co., in the Wheeling district; one Ohio furnace of the Carnegie Steel Co. and the McKeefrey furnace in the Mahoning Valley, one River furnace in Central Ohio, the Lawrence furnace of the Marting Iron & Steel Co., and the Portsmouth furnace in Southern Ohio, as well as the Bessie furnace in the Hocking Valley, one Joliet and two south Chicago furnaces of the Illinois Steel Co., and two Gary furnaces in the Chicago district and the Cumberland furnace in Tennessee.

Blast Furnace Notes

The new F furnace of the Bethlehem Steel Co. at its Sparrow Point plant, Md., was blown in July 10, thus making six furnaces at this plant. D furnace was blown out June 30.

Because of the coal strike in Illinois one Joliet furnace and two south Chicago furnaces, as well as two Gary furnaces, were all banked on July 23 and were still out of commission Aug. 1.

Several furnaces are reported either blown out or banked because of coke shortage, among them being Musconetcong furnace in New Jersey, the Crumwold furnace in the Lehigh Valley, Ella furnace in the Shenango Valley, and the Marshall furnace in western Pennsylvania.

No. 3 Monongahela furnace of the National Tube Co. was operated only one day during July.

The Scottdale furnace in western Pennsylvania was banked during July for repairs.

Diagram of Pig Iron Production and Prices

The fluctuations in pig iron production from 1910 to the present time are shown in the accompanying chart. The figures represented by the heavy line are those of daily average production by months of coke and anthracite iron. The dotted curve on the chart represents monthly average prices of Southern No. 2 foundry pig iron at Cincinnati, local No. 2 foundry iron at furnace at Chicago, and No. 2 X at Philadelphia. They are based on the weekly quotation of THE IRON AGE.

Production of Coke and Anthracite Pig Iron in the United States by Months, Beginning Jan. 1, 1916—Gross Tons

	1916	1917	1918	1919	1920
Jan. ...	3,185,121	3,150,938	2,411,768	3,302,260	3,015,181
Feb. ...	3,087,212	2,645,247	2,319,299	2,940,168	2,978,879
Mar. ...	3,337,691	3,251,352	3,213,091	3,090,243	3,375,907
Apr. ...	3,227,768	3,334,960	3,288,211	2,478,218	2,739,797
May ...	3,361,073	3,417,340	3,446,412	2,108,056	2,985,682
June ...	3,211,588	3,270,055	3,323,791	2,114,863	3,043,540
July ...	3,224,513	3,342,438	3,420,988	2,428,541	3,059,603
7 mos. ...	22,634,966	22,412,330	21,423,560	18,462,349	21,206,029
Aug. ...	3,203,713	3,247,947	3,389,585	2,743,388	.....
Sept. ...	3,202,366	3,133,954	3,418,270	2,487,965	.....
Oct. ...	3,508,849	3,303,038	3,486,941	1,863,558	.....
Nov. ...	3,311,811	3,205,794	3,354,074	2,392,350	.....
Dec. ...	3,178,651	2,882,918	3,433,617	2,633,268	.....
Total yr. *	39,039,356	38,185,981	38,506,047	30,582,878	.....

*These totals do not include charcoal pig iron. The 1918 production of this iron was 347,224 tons.

Iron and Steel Markets

OUTLOOK IMPROVED

Buying of Pig Iron Comes with Freight Increase

Transportation and Fuel Still Controlling—Serious Coal Situation in West—Good Iron Production in July

The steel trade, which indulged in some ill-starred hopes of large orders when the railroads were returned to their owners in March, is making few predictions as to the new business to flow from the large freight rate increase granted this week. It is recognized that time will be required for building up earnings and that financing will not be made easy at once.

The good effect of the rate increase is unmistakable, and whether related to it or not, there has been more active buying in some lines in the past four days, particularly in pig iron. At the same time the industry takes a more cheerful view of the transportation outlook, and has found some actual though not great improvement. In the Pittsburgh district one large interest reduced its piled-up stock of finished material about 20 per cent; but the Carnegie Steel Co. reports little or no progress, having 500,000 tons yet to move.

How the freight advances will affect prices of pig iron and of steel products is widely discussed. Some grades of pig iron have advanced \$4 in the past two months and from \$15 to \$18 in the past year. Fuel and transportation conditions have done this and they are still controlling factors. In comparison, the advance of \$1 to \$1.50 in pig iron costs in the Middle West, due to the new freight rates, is insignificant.

Both pig iron and finished steel are sold delivered at point of production, so that buyers will pay the advances.

New railroad inquiries include 3500 cars for the Missouri, Kansas & Texas and the St. Paul will probably close this week for 1000 box cars and 2000 gondola cars. American Locomotive Co. new orders include 50 for the Chicago & Northwestern and 25 for export. At Chicago two systems will order 12,000 tons of tie plates. Western roads are expected to buy for 1921 more than the 1,000,000 tons of rails which has been taken to represent their annual needs, and Chicago mills could turn out 2,000,000 tons if necessary. The Burlington has reserved space with the Colorado mill for 20,000 tons at a price to be fixed later, and its reservation at Chicago is for 25,000 tons.

The Pittsburgh, Cleveland and Chicago districts have led in pig iron activity for the week, and sales came to a considerable total. Some sellers of North-

ern foundry iron in the Cleveland and Valley districts have advanced their price \$1 per ton. There is an advance of \$1 in Bessemer iron and 50 cents in basic iron at Pittsburgh. A few furnace companies are selling for next year practically at today's prices, but most producers are holding off to take the measure of the freight rate advance.

Pig iron production in July held up better than was expected in view of the railroad blockades. The total was 3,067,043 tons, or 98,937 tons a day, against 3,043,540 tons in June, or 101,451 tons a day. The falling off was thus about 2500 tons a day. But July ran 2600 tons a day ahead of May and 7600 tons a day more than April. There was a net loss of 9 furnaces last month, and the capacity of the 293 furnaces active on Aug. 1 was 93,965 tons a day, against 101,500 tons a day for 302 furnaces on July 1.

The coal situation in Illinois and Indiana again took a serious turn this week, many mines failing to start up. The strike has already been costly to iron and steel and machinery producers around Chicago and further curtailment is threatened.

The strenuous effort of some Pittsburgh steel producers to prevent the ore rate advance from coming entirely on the blast furnaces more or less distant from Lake Erie was defeated. The Commerce Commission left ore rates from Lake Superior mines to upper lake docks untouched and advanced the rate from Lake Erie to Valley furnaces 40 per cent, or from 65 cents to 91 cents, while that to Pittsburgh goes up by the same percentage, or from 91 cents to \$1.274. The ore cost of Lake front furnaces is thus unchanged.

Lake Superior iron ore shipments in July were 9,638,000 gross tons, a gain of 405,000 tons over June. The total movement to Aug. 1 was 26,079,111 tons, as compared with 25,181,848 tons to Aug. 1, 1919.

In the plate market is an inquiry for 30,000 tons of steel for tank ships to be built on the Pacific Coast, and another Western yard is seeking material for an ocean-going ship.

Unfilled orders on the books of independent sheet makers is in excess of 800,000 tons, against a monthly production capacity of 150,000 tons. The manufacturing rate is averaging 70 per cent. The Steel Corporation subsidiary has again had to buy sheet bars, taking probably 20,000 tons recently for conversion chiefly for the automobile trade.

Pittsburgh

PITTSBURGH, Aug. 3.

Transportation conditions temporarily are overshadowed by consideration by the iron and steel industry of the probable increase in producing costs entailed by the increased freight rates recently granted by the Interstate Commerce Commission. As for the movement of material to and from the plants in this district it cannot be said that any decided improvement has taken place in the past week. The Pennsylvania Railroad, however, as a result of the rigid embargo imposed about ten days ago, has succeeded in considerably reducing the number of stored cars and since

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics

At date, one week, one month, and one year previous

For Early Delivery

Pig Iron, Per Gross Ton	Aug. 3, 1920	July 27, 1920	July 6, 1920	Aug. 5, 1919
No. 2 X, Philadelphia	\$49.15	\$49.15	\$47.15	\$29.60
No. 2, Valley furnace	\$46.00	45.00	45.00	26.75
No. 2, Southern, Cin'tif.	45.60	45.60	45.60	28.35
No. 2, Birmingham, Ala.	42.00	42.00	42.00	26.75
No. 2, furnace, Chicago*	46.00	46.00	45.00	26.75
Basic, del'd, eastern Pa.	44.40	44.40	43.00	26.60
Basic, Valley furnace	45.50	46.00	45.00	25.75
Bessemer, Pittsburgh	48.40	47.40	46.40	29.35
Malleable, Chicago*	46.50	46.50	43.50	27.25
Malleable, Valley	46.00	45.00	45.00	27.25
Gray forge, Pittsburgh	44.40	44.40	44.40	27.15
L. S. charcoal, Chicago	37.50	57.50	57.50	31.75

Rails, Billets, etc., Per Gross Ton:

Bess. rails, heavy, at mill.	55.00	55.00	55.00	45.00
O.-h. rails, heavy, at mill.	57.00	57.00	60.00	47.00
Bess. billets, Pittsburgh	65.00	65.00	57.00	38.50
O.-h. billets, Pittsburgh	65.00	65.00	65.00	38.50
O.-h. sheets bars, P'gh.	70.00	70.00	75.00	42.00
Forging billets, base, P'gh.	85.00	85.00	85.00	51.00
O.-h. billets, Phila.	69.10	69.10	69.10	42.50
Wire rods, Pittsburgh	75.00	75.00	75.00	52.00

Finished Iron and Steel,

Per Lb. to Large Buyers: Cents	Cents	Cents	Cents	Cents
Iron bars, Philadelphia	4.75	4.75	4.75	2.745
Iron bars, Pittsburgh	4.75	4.75	4.50	2.75
Iron bars, Chicago	3.75	3.75	3.75	2.62
Steel bars, Pittsburgh	3.25	3.50	3.50	2.35
Steel bars, New York	4.02	4.02	4.02	2.62
Tank plates, Pittsburgh	3.25	3.25	3.50	2.65
Tank plates, New York	3.52	3.77	3.77	2.92
Beams, etc., Pittsburgh	3.10	3.10	3.10	2.45
Beams, etc., New York	3.27	3.27	3.27	2.72
Skelp, grooved steel, P'gh.	3.25	3.25	2.15	2.45
Skelp, sheared steel, P'gh.	3.50	3.50	3.00	2.65
Steel hoops, Pittsburgh	5.50	5.50	5.50	3.00

*The average switching charge for delivery to foundries in the Chicago district is 50c. per ton.

†Silicon, 1.75 to 2.25. ‡Silicon, 2.25 to 2.75.

The prices in the above table are for domestic delivery and do not necessarily apply to export business.

road operations of the other important systems serving this district are comparatively good, there is a more hopeful feeling with regard to the future.

Although the leading independent steel company in this district reports that it has reduced its accumulated stocks of steel from 140,000 tons to about 110,000 tons in the past fortnight, other companies, notably the Steel Corporation subsidiaries, have made almost no progress in cutting down their piled up stocks. The Carnegie Steel Co. is estimated to have approximately 500,000 tons of steel in various forms stocked and awaiting shipment. Any improvement in the transportation situation at large is sentimental rather than actual.

The recent modification of order No. 9 of the commerce commission excluding flat-bottom gondola cars with sides of 38 in. from the coal car class, is expected to help out the mills using that kind of equipment. It is estimated that about 15,000 cars will be released. The shortage of box cars is quite as acute as it has been at any time. The explanation is that the commission's order directing box cars into the grain-producing sections was extended for 30 days from July 24.

Since the new freight rates are calculated to add \$2 and upward per ton to the cost of making steel, and \$1.50 to \$1.75 to the cost of producing pig iron, the tendency of prices on these products to stiffen is observed. Practically all grades of iron have reached higher levels since a week ago, and with available supplies extremely scant and no easing in the coke market, the outlook is unfavorable for any immediate recession.

Pig Iron.—Considerable activity has ruled in the past week and a further advance is observed in prices. Anxiety on the part of melters to secure tonnages for both prompt and deferred deliveries is more pronounced than was the case recently. A feature of the recent transactions has been the sale of Southern foundry iron in this district, while some small lots of malleable

Sheets, Nails and Wire, Per Lb. to Large Buyers	Aug. 3, 1920	July 27, 1920	July 6, 1920	Aug. 5, 1919
Sheets, black, No. 28, P'gh.	7.50	7.50	5.50	4.35
Sheets, galv., No. 28, P'gh.	9.00	9.00	7.00	5.70
Sheets, blue an'td, 9 & 10.	6.00	6.00	4.50	—
Wire nails, Pittsburgh	4.25	4.00	4.00	3.25
Plain wire, P'gh.	3.50	3.50	3.50	3.00
Barbed wire, galv., P'gh.	4.45	4.45	4.45	4.10
Tin plate, 100-lb. box, P'gh.	\$9.00	\$9.00	\$7.00	\$7.00

Old Material, Per Gross Ton:

Carwheels, Chicago	\$37.50	\$35.50	\$35.50	\$26.00
Carwheels, Philadelphia	40.00	40.00	38.00	24.50
Heavy steel scrap, P'gh.	27.00	27.00	25.50	22.00
Heavy steel scrap, Phila.	23.00	23.00	22.50	20.00
Heavy steel scrap, Chgo.	24.50	24.50	23.50	21.00
No. 1 cast, Pittsburgh	41.00	41.00	40.00	23.50
No. 1 cast, Philadelphia	38.00	38.00	37.00	24.00
No. 1 cast, Ch'go (net ton)	36.00	36.00	36.00	24.00
No. 1 RR. wrot, Phila.	33.00	33.00	33.00	26.50
No. 1 RR. wrot, Ch'go (net)	24.50	24.50	25.00	21.00

Coke, Connellsville,

Per Net Ton at Oven:	Furnace coke, prompt	\$18.00	\$18.00	\$17.00	\$3.90
Furnace coke, future	11.50	11.50	11.50	4.12	
Foundry coke, prompt	19.00	19.00	17.00	5.00	
Foundry coke, future	14.00	14.00	14.00	5.00	

Metals,

Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Lake copper, New York	19.00	19.00	19.00	23.00
Electrolytic copper, N. Y.	19.00	19.00	19.00	22.75
Speleer, St. Louis	7.79	7.85	7.85	7.40
Speleer, New York	8.05	8.20	8.20	7.75
Lead, St. Louis	8.75	8.75	8.00	5.50
Lead, New York	9.00	9.00	8.25	5.75
Tin, New York	48.50	48.50	48.00	70.00
Antimony (Asiatic), N. Y.	7.25	7.25	7.50	9.37 1/2

iron have been bought in Buffalo for shipment into the Pittsburgh district. One lot of 1000 tons, 2.25 to 2.75 per cent silicon iron has been sold here at around \$43.25, Birmingham, and another lot of 300 tons at the same figure. Approximately 4000 tons of basic has been sold through this market, some of which is to go to Cleveland and some to Buffalo, the price being \$46, southern Ohio furnace. About 100 tons of high silicon malleable iron has been sold to a Pittsburgh district melter at \$47.25, Buffalo, equal to \$47.85, Valley furnace. We note sales of about 1500 tons of No. 2 foundry from a Valley furnace at \$46. This to-day is a minimum price on the grade. Smaller tonnages of Bessemer iron have sold at \$47.50, Valley furnace. Average prices of basic iron from Valley furnaces, compiled by W. P. Snyder & Co., Pittsburgh, show this grade averaged \$46.015. At least two 1000-ton lots are included in the averages carried a price of \$46.50. The average price of Bessemer iron for July was \$45.806. The Colonial Steel Co. is seeking 5000 to 6000 tons for fourth quarter shipment, while the Mesta Machine Co., which is planning to change one of its open-hearth furnaces from acid to basic lining, is asking for 1000 tons of basic. The Worthington Pump & Machinery Corporation has put out an inquiry for 13,500 tons of foundry iron for its various plants for shipment over the last quarter of this year, and the first half of 1921. It also is in the market for 250 tons of Bessemer.

We quote Valley furnace, the freight rate for delivery to the Cleveland or Pittsburgh district being \$1.40 per gross ton:

Basic	.....	\$46.50
Bessemer	.....	47.00
Gray forge	.....	43.00
No. 2 foundry	.....	46.00
No. 3 foundry	.....	45.50
Malleable	.....	46.00

Ferroalloys.—Extreme dullness still characterizes the market. Steel makers are well covered by contracts for ferromanganese over the remainder of the year, and since current consumption is moderate they are not interested in further supplies. One maker has announced a price of \$200, delivered, for 76 to 80 per

cent for August shipment, and this practically establishes the prompt market at that base, although middlemen still are quoting as high as \$225. Supplies for shipment over the remainder of the year are quoted at \$200, delivered, but this price is merely nominal in the lack of important sales. It is believed this figure would be shaded on attractive inquiries. One inquiry for 200 tons of spiegeleisen is on the market, but sales are confined to a few small lots, which brought \$75, furnace, for average 20 per cent alloy. The New Jersey Zinc Co. has announced an increase to \$80, furnace, for 19 to 21 per cent and to \$77.50 for 16 and 19 per cent, while the American Manganese Mfg. Co. has announced a price of \$85, furnace, for 18 to 22 per cent. This is an advance of \$5 per ton by the former and of \$10 per ton by the latter. Little is going on in Bessemer ferrosilicon, chiefly because so little is available, since the Jackson and New Straitsville, Ohio, furnaces all are down because of the scarcity of coke.

We quote 76 to 80 per cent domestic ferromanganese \$200 for prompt or last half delivery, with a reduction of \$1.50 to \$1.75 per unit for lower percentages. We quote 50 per cent ferrosilicon at \$75 to \$80 and 18 to 22 per cent spiegeleisen at \$75 to \$85, furnace. Prices on Bessemer ferrosilicon are: 9 per cent, \$61; 10 per cent, \$67.50; 11 per cent, \$70.80; 12 per cent, \$74.10. We quote 6 per cent silvery iron, \$54.50; 7 per cent, \$56; 8 per cent, \$58; 9 per cent, \$60, and 10 per cent, \$62.50. An advance of \$3.30 per gross ton is charged for each 1 per cent silicon for 11 per cent and over on Bessemer ferrosilicon, and an advance of \$2.50 per gross ton is charged for each 1 per cent silicon for 11 per cent and over on silvery iron. All the above prices are f.o.b. makers' furnace, Jackson or New Straitsville, Ohio, which has a uniform freight rate of \$2.90 per gross ton for delivery in the Pittsburgh district.

Plates.—Not much activity is observed but on account of the increased cost likely to result from the higher freight rates, makers are holding a little more firmly than they did recently. At least two independents still are naming 3.50c. against inquiries but are losing business at that figure. A range of 3c. to 3.25c. still covers the bulk of transactions. Car builders are getting orders chiefly from industrial companies. It is not expected that the railroads will do much buying of equipment until after the rate increases become effective.

We quote sheared plates, of tank quality $\frac{1}{4}$ in. and heavier, at 2.65c. to 3c. for deferred delivery, while mills which will agree to make specified delivery are quoting 3.50c., but are taking attractive tonnages at 3.25c. and even 3c.

Nuts, Bolts and Rivets.—No material improvement is reported by makers in operating conditions, although a few have been able to secure somewhat larger supplies of bars. Difficulty, however, still is being experienced in obtaining rods and drawn wire. Reduction in the backed up orders is slow and for that reason the tendency to decline new business still is marked. Prices and discounts are unchanged, but to a considerable extent are nominal. They are given on page 361.

Wire Products.—It is doubtful if nails now can be secured from independent makers for less than \$4.25 base per keg, for while one large independent company has not followed the advances of July 12 by the Pittsburgh Steel Co., and of July 15 by the Youngstown Sheet & Tube Co., that company is taking business subject to price at time of delivery, and this, it is figured, will be at least \$4.25, to cover the increased cost entailed in the freight rate increase effective Sept. 1. Demand for nails still is extremely heavy and urgent, and coming from sources that usually are provided from other producing centers. No letup is noted in the demand for barbed wire and lines which ordinarily are dull at this time of the year. Makers are carrying nowhere nearly the usual stocks of nails and jobbers are largely shut off from supplies, because they have been well cared for in the past few months and manufacturers now are trying to ship to distributors at more distant points.

We quote wire nails at \$3.25 base, as the price of the American Steel & Wire Co. and \$4.25 to \$4.50 by independent mills. We quote bright basic wire at \$3, the price of the American Steel & Wire Co., and \$3.75 to \$4 the price range of the independent mills.

Wire Rods.—The independent market is firmer, as demand exceeds the supply and some producers are beginning to figure the increased cost which will result from the new freight rates. Possibly \$75, mill, still can be done, but \$80 is the more general price idea of independent companies and there has been business at the higher figure. Prices are given on page 361.

Spikes.—Demand still is brisk in both large and small spikes and makers who remain in the market are not promising deliveries short of 60 days on new sales of standard spikes and they are sold at least 90 days ahead on small spikes, which are in heavy demand for use in the coal mines. Prices are given on page 361.

Billets and Sheet Bars.—Considerable activity lately has been observed in sheet bars, due to the fact that the American Sheet & Tin Plate Co., unable to secure steel from its regular sources of supply in sufficient quantities to keep its capacity more than 50 per cent engaged, again has opened its books for conversion business. This has resulted in sheet bar business of this sort aggregating approximately 20,000 tons. While at least 2000 tons of this business, with automobile companies the buyers, was done at \$80, Pittsburgh, sale of 500 tons to an enameling company was made at \$70, Pittsburgh, and some business has been done both above and below the latter figure, a price of \$67, mill, being mentioned. Some Youngstown makers still are holding to \$75 for open-hearth bars and \$70 for Bessemer, but these figures find only a limited basis in sales. Too many makers have surplus supplies over their own and customers' requirements, and the buyer has much to say on the prices of these excess tonnages. The market in rerolling billets is very irregular, but generally easy, for much the same causes that are effective in sheet bars. While \$65, mill, still is being sought by Pittsburgh and Youngstown makers, those outside these centers have excess tonnages, which they are anxious to move and \$60 has not recently been exceeded in sales.

We quote 4 x 4-in. soft Bessemer and open-hearth billets at \$38 to \$65; 2 x 2-in. billets, \$42 to \$70; Bessemer sheet bars, \$42 to \$65; open-hearth sheet bars, \$42 to \$70, and forging billets, ordinary carbons, \$80 to \$90 base, all f.o.b. Youngstown or Pittsburgh mill.

Steel Rails.—Some irregularity is observed in prices of light rails, with one independent company claiming to be making sales without much trouble at 3.75c. base, for 25 to 45-lb. sections, while another, reporting some business at 3.25c., base, for these sizes, also admits having lost much tonnage at that figure. It is evident that less than 3.25c. is being done and on rails rolled from new steel, as distinct from rerolled old standard sections. Demand is good, but apparently more easily met than was the case a short time ago, when the prompt market for merchant bars was more active and netted a more profitable return. Railroads are looking around for their 1921 requirements of rails, but actual placing of orders is not expected until after Sept. 1.

The Carnegie Steel Co. is still quoting the March 21, 1919, prices, these being 2.45c. for 25 to 45-lb. sections, 2.49 1/4c. for 16-lb. and 20-lb. sections, 2.54c. for 12-lb. and 14-lb. sections, and 2.58 1/2c. for 8-lb. and 10-lb. sections. This company is also quoting standard sections 50 lb. and heavier at \$45 for Bessemer and \$47 for open hearth stock. The Cambria Steel Co. is quoting 25-lb. to 45-lb. sections at 3.75c., 16-lb. and 20-lb. sections, 3.79 1/2c., 12-lb., 3.84c., at mill, for such delivery as it can make. The Jones & Laughlin Steel Co. is quoting light rails at 3.25c. for 25 to 45-lb. sections.

Hot-Rolled Strips.—Makers still quoting a base of 5.50c., mill, probably will advance shortly to 6c., the minimum already quoted by most producers. Reduced plant operations, due to the shortage of cars, has added considerably to costs and another consideration is the higher freight rates after Sept. 1. Slowing down of the automobile industry has lessened the urgency of the spot demand but has not resulted in cancellations or holdups of shipments.

Coke.—Spot supplies of beehive oven coke remain extremely scant, in spite of the fact that there has been some improvement in the car placements in the Connellsville region, which has been attended by an increase in production. Oven output remains woefully inadequate.

quate to meet the requirements of both those covered by contracts, who are getting shipments only in keeping with the car supply, and those without contracted supplies, who are anxious to keep in operation. We note a sale of 200 cars of furnace coke for shipment to a Buffalo melter at \$18.75 per net ton, oven, while on smaller lots \$19 is being done. Some business also is heard of at \$18 in furnace fuel, but in general \$18.50 measures the minimum. Foundry grade takes a range of from \$19 to \$20.

Cold-Rolled Strips.—The minimum base of 8.50c. still is quoted by a few makers but this is likely to disappear soon as those quoting this figure complain that higher operating costs, due to curtailed operations, are reducing the margin of profit. Most makers are quoting 9c. and some business still is being done as high as 10c., base.

Iron and Steel Bars.—While 4c. largely has disappeared as far as sales for merchant steel bars are concerned, that price still is being named by one independent maker and early shipments are specified. Generally the independent market is quotable from 3c. to 3.50c., although one company which recently has been quoting the lower figure named 3.25c. against an inquiry on a shipment after Sept. 1 to cover the probable increase in producing costs resulting from the higher freight rates. Demand for concrete reinforcing bars is rather slow and prices are easier. Iron bars are firm, with makers well sold up for the remainder of the year.

We quote steel bars rolled from billets at 2.35c., this being the price of the Carnegie Steel Co. for very indefinite delivery, likely not before first quarter of next year. Other mills rolling steel bars from billets quote from 3c. to 3.50c. at mill, prices depending entirely on the buyer and the delivery wanted. We quote reinforcing bars, when rolled from billets, at 3.75c. to 4c., and from old steel rails at about 3.50c. at mill. We quote common iron bars at 4.75c. and refined iron bars at 5c. in carloads, f.o.b. mill, Pittsburgh.

Structural Material.—The situation in this district has taken on a slightly more cheerful aspect since a week ago, although the improvement is measured largely in the inquiries rather than in actual business or in operating and shipping conditions. Awards coming to shops in this district in all cases involve small tonnages. The American Bridge Co. has taken 300 tons for a bridge at New Castle, Pa., 300 tons for a railroad bridge for the Indianapolis division of the Big Four system, and 25 800-ton steel barges for the Carnegie Steel Co., which will be used by the latter in the transportation of steel to the various plants of that company in the Pittsburgh district. The New York Central Railroad has placed a bridge at Wesleyville, Pa., involving 450 tons, with McClintic-Marshall Co. The increased freight rates are expected to bring about a revival of railroad construction. Fabricating interests continue to be hampered both by their inability to secure steel or to ship finished material. The leading independent company in this district last month operated only 60 per cent of capacity, and ran almost entirely on material for stock. The market in plain structural material still is more favorable to buyers than to sellers, although on account of the increased cost likely to result from the increased freight rates, shading of prices is less common than it has been. Prices are given on page 361.

Cold Finished Steel Bars.—Automobile builders who are not feeling the effects of the present money stringency continue to seek early tonnages, especially in the smaller sizes, and a good demand still exists also from the automatic screw machine interests, but on the whole the demand has lost much of the urgency it recently had. The market maintains a firm tone, however, and can be described as strong on screw stock bars, on which the makers are sold several months ahead and are in a position to take on only very limited new tonnages. One maker here is quoting 4.10c., another 4.25c., base, while another company which can make reasonably early delivery is quoting 6c. minimum. We note one sale of about 300 tons of small sizes to an automobile company at 6c., base, for early shipment.

Iron and Steel Pipe.—The supply situation continues quite acute, for while there has been some improve-

ment in railroad operation, there has been no increase in the supply of railroad equipment, and this has seriously restricted the movement to and from the mills. The National Tube Co. is merely hobbling along at its National and Pennsylvania works, having less than 50 per cent of its pipe furnaces in operation at the former plant and only one out of six furnaces at the Pennsylvania works. The Ellwood City, Pa., and Wheeling, Ohio, plants of this company also are more or less curtailed, but comparatively full operations are maintained at the Lorain, Ohio, works, where ample storage facilities exist. Independent pipe manufacturers are operating on the average of about 75 per cent of their capacity, and are having only a fair measure of success in making shipments. Demands show no relaxation in any direction. The Ford Motor Co. has put out an inquiry for 10 to 12 miles of 16-in. line pipe, presumably for piping gas. Prices and discounts are given on page 361.

Tin Plate.—Shortage of box cars is an extremely restrictive factor. Some of the big can makers, who are not getting shipments against contracts, are canvassing the market for spot tonnages and finding little available except stock items for which they are paying independent makers from \$9 to \$10 per base box, Pittsburgh. Tin plate operations are on a relatively high rate but the independent mills are more fully engaged than are those of the American Sheet & Tin Plate Co., which is having difficulty in securing supplies of steel. The Western plants of the company are doing fairly well in the matter of shipments, as the Western roads are permitting the loading of box cars in the direction of the grain-producing areas, a privilege which is being denied by the Eastern roads. Hundreds of empty cars daily are passing through Pittsburgh on their way west.

We now quote tin plate to domestic consumers for remainder of the year delivery at \$7 to \$8.50 base box; stock items \$9 to \$10, and for export \$11 to \$12 per base box, all f.o.b. Pittsburgh.

Sheets.—Operations of the mills of the American Sheet & Tin Plate Co. the past week have been considerably less than 50 per cent of capacity, due to the fact that on account of the railroad congestion the company has had much trouble in securing sheet bars from its regular sources. As a result of this condition and in an effort to maintain mill organizations, the company again has opened its books for conversion business and in the past week or ten days have taken about 20,000 tons of this character. Not a little of this tonnage has been placed by automobile companies, and this development has tended to relieve the fear which recently existed about the conditions in that industry. Independent sheet makers seem to be getting ample supplies of sheet bars and for that reason have been averaging higher than 70 per cent operations in the past month. Shortages of cars, however, is restricting shipments by all makers. It is just as hard and quite as costly as it has been any time recently to place early shipment business. Prices are given on page 361.

Hoops and Bands.—A somewhat quieter market exists in prompt lots largely because of the slowing down of the automobile industry. Cancellations have been few and unimportant, but a number of requests for suspension of shipments are noted. Makers are no more able to take on early shipment business than they have been because of the short steel supply and the transportation conditions; 5.50c. still is the minimum independent base on such business. The Steel Corporation continues to take business for indefinite delivery at the old March 21, 1919, figure.

Cotton Ties.—Indications of a cotton crop of more than twelve million bales gives rise to the belief that a shortage of cotton ties is unavoidable and some distributors who failed to get in their orders early are seeking a place on the makers' books. The August price of ties is \$2.48 per bundle by the Pittsburgh Steel Co. and \$2.03 by the Carnegie Steel Co.

(Continued on page 358C)

Chicago

CHICAGO, Aug. 3.

The coal situation has again taken on a serious aspect as a result of the failure of most of the Illinois mines to resume operation yesterday morning. Instead of going back to work the men held meetings of their locals and decided to stay out until the new wage adjustment for day men is announced. Reports received by the Burlington Railroad to-day indicated that only four small mines are operating while on the Chicago & Eastern Illinois only twelve Illinois mines are again producing. Conditions in Indiana seem to be somewhat better. Of the 87 mines on the Chicago & Eastern Illinois, 45 have resumed, 32 of them being in Indiana.

The results of the strike have already been serious in this district, and if there is not an early return to normal production, many industries will be forced to suspend operation altogether. The bar iron mill of the Republic Iron & Steel Co. at East Chicago is now idle, while the mill of the Interstate Iron & Steel Co. has reduced its busheling output 50 per cent. The finishing mills of the Inland Steel Co.'s No. 2 plant at Indiana Harbor have been shut down, reducing that company's production of finished material to about 60 per cent of capacity. The Wisconsin Steel Co. is turning out only about 55 per cent of its normal steel output, and the mills of the leading interest are on a 65 per cent basis. The latter however has not banked any additional blast furnaces since a week ago when five became inactive.

In contrast with the fuel situation, transportation is steadily improving. The revised ruling of the commerce commission permitting the unrestricted use of gondola cars with sides 38 in. in height or under has been a help, while in the local switching district, the embargo which shut off all traffic except that authorized by permit has been lifted. The large accumulations of finished materials which crowded plant yards several weeks ago have been reduced to normal proportions.

The early advance in freight and passenger rates is expected to bring out generous buying of equipment by the railroads. As yet there has been no material decrease in inquiries for rolling stock, but numerous Western lines have advised the local rail mill of their 1921 requirements and it is likely that contracts for a large aggregate tonnage will be closed as soon as the Steel Corporation determines its price policy for the coming year. The Burlington has reserved space with the Colorado Fuel & Iron Co. for 20,000 tons at a price to be determined later and has asked the local mill to supply 25,000 tons. Track supplies are active, inquiries for 5500, 5000, and 1500 tons of tie plates pending and an order for 1500 tons having been placed.

The feature of the plate market is an inquiry for 30,000 tons of steel for tank ships to be built on the Coast. Structural shapes continue sluggish, while the situation as to other forms of finished material is unchanged. Pig iron is still strong although fewer large inquiries and orders are to be noted.

Pig Iron.—A local mill is in the market for 5000 tons of high phosphorus foundry for delivery within the next three months. A Wisconsin foundry wants 1000 tons of malleable for early shipment and a Minnesota consumer is asking for 500 tons of malleable also for early delivery. A sale of 1200 tons of foundry for first half delivery has been made at \$42 base, Birmingham. While a few Southern furnaces are quoting higher than \$42 on that delivery, the principal factors in this market are adhering to the old prices. A fair sized tonnage of Northern foundry for first half shipment has been contracted for at \$46 base furnace, although the leading furnaces are not anxious to book business so far ahead. Little Virginia foundry iron seems to be moving at the new price of \$47 base furnace, although 150 tons of Virginia analysis for prompt shipment recently brought \$47, base Birmingham. Basic iron from the Soo furnaces is now being offered at \$47.50 delivered, Chicago, while Soo foundry is quoted as \$50, Chicago. Several thousand tons of low phosphorus have been sold in this district in the past two weeks and prices have stiffened. An Eastern stack is

now asking \$54, furnace, for copper bearing, while an Ohio producer is getting \$57 for copper free material. The Milwaukee furnace which was expected to get into blast several months ago is not yet in. There has been little improvement in by-product coke production in this district and bee-hive coke is still difficult to obtain. Local by-product foundry coke has advanced \$1 to \$16.50, ovens, while Connellsburg foundry still commands \$19 to \$19.50 per net ton, ovens. A local steel plant has succeeded in purchasing 3000 tons of run of oven furnace coke at \$17.30, delivered.

The following quotations are for iron delivered, at consumers' yards except those for Northern foundry, malleable and steel-making irons, including low phosphorus, which are f.o.b. furnace and do not include a switching charge averaging 50c. per ton.

Lake Superior charcoal, averaging sil.		
1.50 (other grades subject to usual differentials), deliv. at Chicago		\$57.50
Northern coke, No. 1, sil. 2.25 to 2.75		
last half		48.25
Northern coke, No. 1, spot		48.25
Northern coke foundry, No. 2, sil.		
1.75 to 2.25 last half		46.00
Northern coke, No. 2, spot		46.00
Northern high phos., last half		45.00
Southern coke, No. 1 foundry and		
No. 1 soft, sil. 2.75 to 3.25		50.20
Southern coke, No. 2 foundry, sil.		
2.25 to 2.75		48.70
Southern foundry sil. 1.75 to 2.25		47.00
Malleable not over 2.25 sil.		46.50
Basic		46.00
Low phos. (copper free)		57.00
Silvery, 7 per cent		\$56.40 to 59.80

Ferroalloys.—A sale of 300 tons of spiegeleisen has been made at approximately \$75, furnace. Ferroalloys are generally quiet. Ferromanganese is now to be had for both prompt and more extended delivery at \$200.

We quote 75 to 80 per cent ferromanganese, prompt and last half, delivered, \$200; 50 per cent ferrosilicon at \$85, delivered; spiegeleisen, 18 to 22 per cent, \$75 furnace.

Plates.—The prospect of good crops, the slow but steady improvement in railroad service and the efforts of the Government toward a solution of the coal problem are all regarded as harbingers of better industrial production and a resumption of business on a flourishing scale. The advance in rates is expected to bring out a large volume of buying by the railroads which have accumulated wants of several years to satisfy. Present business, however, continues rather dull, although signs of improvement are to be noted. Manufacturers of oil storage tanks are again filling their order books and tank car builders are finding a ready market for their cars, though most of them are sold in small lots and therefore do not attract wide attention. A Pacific Coast shipbuilder is inquiring for 30,000 tons of steel, largely plates, for tank vessels, while another Western yard wants an as yet unspecified tonnage for an ocean-going ship. The inquiry of the Chicago & Illinois Midland for 1000 gondola cars, mentioned in the railroad rolling stock paragraph last week, has resulted in a request for figures on 11,000 tons of plates, shapes and bars. Independent mill quotations on tank plates range from 3.25c., Pittsburgh, to 3.50c., while as low as 3c. has been named in a few instances.

The mill quotation is 2.65c. to 3.50c., Pittsburgh, f.o.b. freight to Chicago being 27c. per 100 lb. Jobbers quote 3.67c. to 4.17c. for plates out of stock.

Bars.—The demand for mild steel bars is good, and while independents are experiencing little difficulty in booking small tonnages for prompt shipment at 4c., Pittsburgh, 3.50c. and in some cases less are being quoted on larger lots for extended delivery. Inquiry for bar iron and hard steel bars is not active, and mills are laboring under operating difficulties. Shortage of fuel has forced one bar iron plant to suspend work, while the failure to reach a wage agreement has closed a rail carbon mill. Other hard steel bar mills are hampered in their operations by a shortage of rerolling rails.

Mill prices are: Mild steel bars, 2.35c. to 4c.; Pittsburgh taking a freight of 27c. per 100 lb.; common bar iron, 3.75c. to 4c., Chicago; rail carbon, 3.75c., mill.

Jobbers quote 3.37c. to 3.87c. for steel bars out of warehouse. The warehouse quotation on cold rolled steel bars is 5.80c. for rounds and 6.30c. for flats and squares, an extra of 15c. per 100 lb. applying to orders exceeding 1000 lb. and under 2000 lb. and an extra 35c. for orders up to 1000 lb.

The mill quotation is 2.45c. to 3.25c., Pittsburgh, which takes a freight rate of 27c. per 100 lb. for Chicago delivery. Jobbers quote 3.47c. to 3.97c. for materials out of warehouse.

Sheets.—Owing to operating difficulties it is improbable that mills will be able to add materially to their bookings for several months to come. During the last half of June the members of the National Association of Sheet and Tin Plate Manufacturers, comprising most of the independent mills, were operating at an average of 82 per cent of capacity. In the first half of July the percentage dropped to 57. It is believed that there has been some improvement since that time, although reports from Ohio and the Pittsburgh districts are still discouraging. While most mills are taking new business with difficulty, the leading Eastern independent is not only booking tonnage for its new sheet mill, but is in a position to give good delivery. The market is firm and prices are often stronger than heretofore.

Mill quotations are 4.35c. to 8.50c. for No. 28 black; 3.55c. to 7.50c. for No. 10 blue annealed, and 5.70c. to 10c. for No. 28 galvanized, these all being Pittsburgh prices, subject to a freight of 27c. per 100 lb. to Chicago. The lowest prices are those of March 21, 1919.

Jobbers quote: Chicago delivery out of stock, No. 10 blue annealed, 6.02c. to 7.02c.; No. 28 black, 7c. to 8c.; No. 28 galvanized, 8.50c. to 9.50c.

Structural Material.—Structural shapes are very slow, and quotations on plain material by independent mills have settled to a ruling maximum of 3.25c., Pittsburgh, while even lower prices are frequently heard of. There are few fabricating awards to report this week, but inquiries are more numerous. Lettings include:

Commonwealth Edison Co., Calumet Power Station, Chicago, 2616 tons to American Bridge Co.

Calumet & Hecla Mining Co., reclamation plant, Tamarack, Mich., 1350 tons to American Bridge Co.

Current inquiries include:

Union Liberty Furniture Co., Chicago, 1000 tons, W. W. Ahlschlager, architect.

Pittsburgh Malleable Iron Co., Pittsburgh, 1650 tons, bids asked by Frank D. Chase, Inc., Chicago.

Great Northern Railroad, ore pocket renewals, Superior, Wis., 1180 tons.

Alaska Engineering Commission, Riley Creek viaduct, 500 tons.

Standard Oil Co., office building, Milwaukee, 400 tons.

Weil Bros., Chicago, machine shop and foundry, Michigan City, Ind., 307 tons.

Hotel and theater building, Evansville, Ind., 250 tons, J. E. O. Pridmore, architect, Chicago.

Stevens Adamson Mfg. Co., Aurora, Ill., 225 tons.

Leonard Tractor Co., Gary, Ind., 202 tons.

New bids will be asked on the superstructure of the Madison Street bridge, Chicago, a job involving 1800 tons.

The mill quotation is 2.45c. to 3.25c., Pittsburgh, which takes a freight rate of 27c. per 100 lb. for Chicago delivery. Jobbers quote 3.47c. to 3.97c. for materials out of warehouse.

Wire Products.—Production of the leading interest in this district is again about 80 per cent of capacity and car service is improved. The demand is unabated. For mill prices, see Finished Iron and Steel, f.o.b. Pittsburgh, page 361.

Rails and Track Supplies.—Numerous Western lines have placed their 1921 rail requirements on record with the local mill, and it is probable when the latter's policy as to price is settled, contracts will be signed. The needs of Western roads may be conservatively estimated at close to 1,000,000 tons per year and it is anticipated that this figure will be exceeded. Should the advance in transportation rates result in buying on the most liberal scale, local mill capacity could turn out as much as 2,000,000 tons. Inquiries for tie plates and track fastenings are numerous. The Burlington is in the market for 5500 tons of tie plates; the Pennsylvania Southwestern and Northwestern regions for 5000 tons, and the Pennsylvania, Pittsburgh office, 1500 tons. An order for 1500 tons for indefinite delivery has been placed. The demand for light rails continues strong.

Standard Bessemer rails, \$45 to \$55; open hearth rails, \$47 to \$57. Light rails, 2.45c. to 3.50c., f.o.b. makers' mills. Standard railroad spikes, 3.55c. to 4.25c., Pittsburgh. Track bolts with square nuts, 4.90c. to 7c., Pittsburgh. Steel tie plates, 3c. and steel angle bars, 2.75c., Pittsburgh and Chicago. Tie plates, iron, 3.75c. to 4c., f.o.b. makers' mills.

Cast-Iron Pipe.—Brillion, Wis., which took bids on 350 tons several weeks ago has indefinitely postponed the purchase of the pipe. The market is exceedingly dull.

We quote per net ton f.o.b. Chicago, ex-war tax as follows: Water pipe, 4-in., \$79.80; 6-in. and above, \$76.80: 8-in. A lead gas pipe, \$2 extra.

Bolts and Nuts.—Specifications are liberal, although it is becoming apparent that the requirements of the

automobile industry will be less than previously. For mill prices see Finished Iron and Steel, f.o.b. Pittsburgh, page 361.

Jobbers quote structural rivets, 5.62c., boiler rivets, 5.72c.; machine bolts up to $\frac{1}{2}$ x 4 in., 20 per cent off; larger sizes, 10 off; carriage bolts up to $\frac{1}{2}$ x 6 in., 10 off; larger sizes, 5 off; hot pressed nuts, square tapped and hexagon tapped, list price; coach or lag screws, gimlet points, square heads, 30 per cent off. Quantity extras are unchanged.

Railroad Rolling Stock.—The Missouri, Kansas & Texas is in the market for 2000 automobile cars and 1500 gondola cars. The St. Paul has not yet taken action on its inquiry for 1000 box cars and 2000 gondola cars, but is expected to close in the current week. The Chicago & Northwestern has ordered 50 locomotives from the American Locomotive Co.

Old Material.—Purchases of heavy melting steel by the leading steel interest last week totaled about 15,000 tons, which brought \$25 per gross ton. A local melter bought several hundred tons of malleable at \$32.50 per gross ton and another Chicago foundry bought a fair-sized tonnage of both malleable and steel. The coal strike damped market activity the latter part of last week, but interest has since revived. The prices are firmer, although there have been few advances. Rolling mill grades are dull owing to the suspension of operation by one bar iron mill and expected curtailment by others. Transportation conditions are steadily improving. Among railroad offerings are the Pennsylvania, Northwestern region, 200 tons; Pennsylvania, Southwestern region, 1500 tons, and the Erie and New York Central, blind lists.

We quote delivery in consumers' yards, Chicago and vicinity, all freight and transfer charges paid, as follows:

	Per Gross Ton
Iron rails	\$35.00 to \$36.00
Relaying rails	52.50 to 57.50
Car wheels	37.50 to 38.00
Steel rails, rerolling	36.00 to 37.00
Steel rails, less than 3 ft.	29.50 to 30.00
Heavy melting steel	24.50 to 25.00
Frogs, switches and guards, cut apart	24.50 to 25.00
Shoveling steel	24.00 to 24.50
Low phosph. heavy melting steel	29.50 to 30.00
Drop forge flashings	21.50 to 22.00

	Per Net Ton
Iron angles and splice bars	\$32.50 to \$33.00
Steel angle bars	24.50 to 25.00
Iron arch bars and transoms	33.50 to 34.00
Iron car axles	41.50 to 42.00
Steel car axles	34.50 to 35.00
No. 1 busheling	20.00 to 20.50
No. 2 busheling	12.50 to 13.00
Cut forge	24.00 to 24.50
Pipes and flues	17.00 to 17.50
No. 1 railroad wrought	24.50 to 25.00
No. 2 railroad wrought	24.00 to 24.50
Steel knuckles and couplers	25.50 to 26.00
Coil springs	27.00 to 27.50
No. 1 cast	36.00 to 37.00
Boiler punchings	25.50 to 26.00
Locomotive tires, smooth	24.00 to 24.50
Machine shop turnings	9.50 to 10.00
Cast borings	13.00 to 13.50
Stove plate	28.00 to 28.50
Grate bars	28.50 to 29.50
Brake shoes	25.50 to 26.00
Railroad malleable	28.50 to 29.00
Agricultural malleable	28.00 to 28.50
Country mixed	16.00 to 17.00

Boston

BOSTON, Aug. 3.

Pig Iron.—Outstanding features of the market since last reports are the decrease in buying, especially of Alabama iron, and the strengthening of eastern Pennsylvania and Virginia prices. Sales approximate 6000 tons, about half being Pennsylvania on a \$47 to \$48 furnace base. Sales include one lot of 600 tons silicon, 1.75 to 2.25, last quarter shipment, at \$49.90 delivered to a western Massachusetts buyer. Practically all other sales involve higher silicon. Several furnaces have withdrawn from the 1920-1921 market. Early in the week Virginia silicon, 2.25 to 2.75 per cent, sold at \$46 furnace base, but all recent transactions were at \$47 to \$48 base, the higher priced iron taking a \$2 differential. Sales of Virginia include 500 tons silicon, 2.25 to 2.75, last half shipment, to a Connecticut melter at \$48 furnace base. A New Britain, Conn., consumer bought 300 tons silicon, 2.75 to 3.25, prompt shipment, at practically \$54 delivered, and Fall River and Westfield, Mass., melters like amounts at the same base price. Altogether 1300 tons Alabama iron was sold. Arrangements

ments are made to bring another barge of Southern iron into Bridgeport, Conn., at an early date. About 600 tons resale Buffalo silicon, 2.75 to 3.25, last quarter delivery, sold at \$48 furnace or \$45 base. No other Buffalo iron was moved. A small tonnage of Tennessee, minimum silicon 2.50 per cent, first quarter delivery, sold at \$45 furnace base. A New Hampshire foundry wants 200 tons, silicon 3.25 to 3.75, and 300 tons malleable, fourth quarter delivery. The Worthington Pump & Machinery Corporation is inquiring for a round tonnage for first half. Some foundries working on automobile castings have cancellations and others have been asked to slow up production, but generally speaking melters are extremely busy. Receipts of iron have been small the past week. Delivered prices follow:

East, Penn., sil. 2.25 to 2.75.....	\$51.15 to \$52.90
East, Penn., sil. 1.75 to 2.25.....	49.90 to 50.90
Buffalo, sil. 2.25 to 2.75.....	50.15 to 51.15
Buffalo, sil. 1.75 to 2.25.....	48.90 to 49.90
Virginia, sil. 2.75 to 3.25.....	53.20 to 55.20
Virginia, sil. 2.25 to 2.75.....	51.95 to 53.95
Virginia, sil. 1.75 to 2.25.....	50.70 to 52.70
Alabama, sil. 2.75 to 3.25.....	53.00 to 54.15
Alabama, sil. 2.25 to 2.75.....	51.25 to 52.40
Alabama, sil. 1.75 to 2.25.....	50.00 to 51.15

Coke.—Several hundred tons Connellsville coke has sold for \$19.50 to \$20.50 per ton, f.o.b. ovens, mostly \$20 to \$20.50. The New England Coal & Coke Co. still quotes \$21.90 delivered, and therefore is \$2.50 under the Connellsville market. That company is operating at slightly less than 60 per cent of capacity. Foundations for its two new Pennsylvania crushers are in, but it probably will be September or October before this machinery is in operation. The crushers each have a 250-ton per hour capacity. The Providence Gas Co. coke shipments are still curtailed, due to lack of coal, labor conditions at the mines being poor. This company expects to increase its coal receipts by the last of this month.

Old Material.—The movement of No. 1 machinery cast at around \$43, delivered, and textile cast at around \$44, has slightly improved, foundries short of pig iron being the buyers. No. 2 machinery cast is difficult to sell, however. A small tonnage of turnings has been bought by dealers at \$12.50 to \$13, f.o.b. shipping point, but because of railroad embargo shippers are not anxious to purchase. Aside from these transactions the old material market has been quiet and featureless. Prices as quoted at the local yards follow:

No. 1 heavy melting steel.....	\$18.50 to \$20.50
No. 1 railroad wrought.....	26.00 to 27.00
No. 1 yard wrought.....	23.00 to 24.00
Wrought pipe (1 in. in diameter, over 2 ft. long)	16.00 to 17.00
Machine-shop turnings	14.00 to 14.50
Cast-iron borings	15.50 to 16.00
Heavy axle turnings	14.00 to 14.50
Blast furnace borings and turnings	13.00 to 14.00
Forged scrap	13.00 to 13.50
Bundled skeleton	13.00 to 13.50
Street car axles	31.00 to 32.00
Car wheels	37.00 to 38.00
Machinery cast	39.00 to 40.00
No. 2 cast	35.00 to 36.00
Stove plate	23.50 to 24.50
Railroad malleable	27.50 to 28.00
Rerolling rails	28.00 to 30.00

Finished Material.—The inability of mills to secure open cars, coal and other supplies in sufficient quantities and a renewal of embargoes to all-rail New England points have further reduced receipts of finished iron and steel since last reports. The demand for practically everything but structural steel holds well, but mill representatives are accepting little new business. The lack of available money for construction accounts for the condition of the structural market. Fabricators are figuring on approximately 1000 tons for the new Farrel Foundry & Machine Co.'s Buffalo plant, and better than 100 tons for the New England Tire & Rubber Co., Holyoke, Mass. The New Haven Railroad is to award 200 tons to the Boston Bridge Works for two Massachusetts bridges. Plate prices take a wide range, as usual. A shipyard has awarded about 1500 tons for 10,000-ton steamer. A Massachusetts builder of hot water boilers has cancelled 350 tons No. 10-gage blue annealed sheets, but no other important cancellations are reported. Pipe and wire nails are especially

short just now. Warehouses have almost no small bar stock to offer, and there is some talk of those firms asking \$5.50, advancing their prices. Jobbing prices on common carriage and machine bolts and on semi-finished and case-hardened nuts have been advanced about 10 per cent.

Jobbers quote: Soft steel bars, \$5.50 to \$6.50 per 100 lb. base; flats, \$6.50 to \$6.85; concrete bars, \$6 to \$6.50; tire steel, \$7 to \$7.50; spring steel, open hearth, \$11; crucible, \$16; steel bands, \$8 to \$8.25; steel hoops, \$9; toe calk steel, \$8; cold-rolled steel, \$10 to \$10.50; structural, \$6 to \$6.50; plates, \$6.50; No. 10 blue annealed sheets, \$9; No. 28 black sheets, \$9.15; No. 28 galvanized, \$10.50; refined iron, \$5.50 to \$8; best refined, \$7 to \$7.50; Wayne, \$8.50; band iron, \$8; hoop iron, \$9; Norway iron, \$20.

Buffalo

BUFFALO, Aug. 3.

Pig Iron.—Operation and transportation continues to be the transcendent phase of the industry. The car situation has been further disturbed by the recent railroad board order, sending about 30 per cent of a possible 40 per cent of cars at mines to boats and ore docks. This leaves 10 per cent available for the industry, though one of the improved phases has been the lowering of the restriction allowing 38-in. side cars to haul other than coal, instead of only 36-in. sides. Railroads have placed further embargoes on iron shipments, the Pennsylvania having embargoed all Western shipments. New England points are likewise under embargo. There is a sharply defined demand for first half iron, but little selling. So far as can be learned the only first half iron taken last week was a small tonnage to an old customer at a price above the market but not indicating a definite price policy. The interest that sold this iron also sold about 1000 tons through its sales agency connections for last half delivery at market price. Blast furnace production is very low. Two furnaces are still down, and the others are operating very precariously so far as coke is concerned. Much complaint regarding poor quality coke and consequent high sulphur iron is encountered. One furnace reports a little improvement in car supplies, and as it has contracts with many customers near Pennsylvania mines, is able to utilize high-side cars occasionally.

We quote f.o.b. Buffalo:

No. 1 foundry, 2.75 to 3.25 sil.....	\$48.00
No. 2 X foundry, 2.25 to 2.75 sil....	46.25
No. 2 plain, 1.75 to 2.25 sil.....	45.00
Basic	45.00
Malleable	46.25
Lake Superior charcoal.....	\$58.00 to 60.00

Finished Iron and Steel.—Inquiry is not marked by the degree of activity of a month ago, but is still fairly lively and is sufficient to keep the market spirited, in spite of the serious difficulties in the way of shipment. There is a marked inquiry for bars, wire products and for sheets, though the sheet demand is slowing down somewhat, due, it is said, to slackness in the automobile industry. This slackness is reflected in lack of inquiry for forgings and material which goes into the making of accessories. This does not indicate poor business conditions, in the opinion of steel makers, but the reaction brought about by the banks restricting credits to the automobile makers, resulting in lack of liquid assets to finance dealers. Plates and shapes are a trifle weak and makers are no longer able to get 4c. for plates. One mill reports about 60 days' business ahead on plates, but still able to book plate business for delivery from 30 to 60 days, depending on the grade required. Mill production is only fair, due to poor quality of iron. The operation of open-hearth furnaces is also being retarded by lack of fuel.

Jobbers quote the following prices for this territory: Steel bars, 4.61c.; iron bars, 5.26c.; structurals, 4.46c.; plates, 4.66c.; No. 10 blue annealed sheets, 6.51c.; No. 28 black sheets, 8.25c.; No. 28 galvanized sheets, 9.50c.; bands, 5.81c.; hoops, 6.06c.; cold rolled steel, 6.00c.

Old Material.—The market has not been marked by any particularly important transactions, though dealers here expect that a renewed demand for heavy melting steel now featuring the Pittsburgh market may be reflected here within a short time. This demand, it is believed, may result in the price of this grade going

higher, as has been predicted by some dealers. The entire list of old material shows a little more life, turnings in particular. Borings are also in strong demand, the market having been fairly well depleted by a heavy purchase made here as reported two weeks ago.

We quote dealers' asking prices per gross ton, f.o.b. Buffalo as follows:

Heavy melting steel, regular grades.....	\$25.00 to \$26.00
Hydraulic compressed.....	23.00 to 23.50
Low phos., 0.04 and under.....	31.50 to 32.50
No. 1 railroad wrought.....	30.50 to 31.50
No. 1 machinery cast.....	37.50 to 38.50
Iron axles.....	38.00 to 39.00
Steel axles.....	38.00 to 39.00
Car wheels.....	37.00 to 38.00
Railroad malleable.....	30.50 to 31.50
Machine-shop turnings.....	15.00 to 16.00
Heavy axle turnings.....	19.50 to 20.50
Clean cast borings.....	19.50 to 20.00
Iron rail.....	29.50 to 30.50
Locomotive grate bars.....	23.50 to 24.50
Stove plate.....	31.50 to 32.50
Wrought pipe.....	20.50 to 21.50
No. 1 busheling.....	19.50 to 20.50
Bundled sheet stampings.....	16.50 to 17.50

Birmingham

BIRMINGHAM, Aug. 2.

The two largest foundry iron makers each booked in the month of July twice what they did in June. The July business was scattered, but the Chicago district was the largest taker. More Birmingham iron has gone into that field in the past four months than ever before and orders from that section compose a large proportion of the current bookings. Several more 1000-ton lots were taken by Chicago in the past week for the fourth quarter and first quarter of 1921. A third interest has opened up for 1921 delivery, sold a small amount in two days and at the close of the week had 5000 tons under consideration. Cincinnati and Chicago territory were well represented in this business. One small furnace interest sold a small tonnage for nearby delivery at \$43, but this price was quite exceptional, none of the makers, as a rule, asking more than \$42 for any delivery. Offers of premium for spot delivery by distressed concerns not customers have not been considered. Southern iron and steel operators made a final appeal to the Interstate Commerce Commission to allow a more liberal allocation of freight cars to the Birmingham district. The Birmingham Terminal Committee representing the commission, announced that there were 8500 car loads on the yards of the producers in the district waiting shipment to the consumers, or 340,000 tons, of which 150,000 tons represent iron and steel products. All furnaces and mills still manage to secure raw material and no furnace has either been banked or blown out. The Ensley City is now loading at Mobile with 5000 tons of Birmingham steel products for Rotterdam, the second cargo to that point of these products in two months. Charcoal iron has sold as high as \$60 and the minimum is \$58.

We quote per gross ton, f.o.b. Birmingham district furnaces, the Tennessee company excepted, as follows:

Foundry, s.s. 1.75 to 2.25.....	\$42.00
Basic.....	41.00
Charcoal.....	58.00 to 60.00

Cast Iron Pipe.—American Cast Iron Pipe & Foundry Co. and the United States Cast Iron Pipe Co. will cooperate in a shipment of 2600 tons of gas and water pipe to the Pacific Coast by the steamer Cape Henry leaving Mobile this week. Two prior shipments of 3500 tons each went successfully to Los Angeles and San Francisco in April and May. Orders for small sizes of pipe come in regularly, but large sizes are ordered sparingly. Sanitary pipe shops report jobbers as ordering liberally for stocking up purposes. They have been bare of stock for several months, shipments having been direct to consumers.

Coal and Coke.—Coke is still more acute owing to inability of two plants to operate by reason of coal mine strikes. The lowest price for standard foundry is \$13.50 and one large maker sells at \$16 with the trade anxious to get all that can be gotten. Birmingham is about to secure by-product gas through an arrangement with one of the local by-product producers. Coal output has increased 75,000 tons weekly

since the operators in the domestic field resumed operations in face of the strikers.

Old Material.—The scrap dealers are holding No. 1 heavy steel for higher prices and there is a deadlock in that field. Consumers have been offering \$22, which is an advance over prior prices, but the yards are stiff in their demand for more. The dealers are all the more inclined to be obstinate as it is very difficult to move stuff on account of the car shortage.

We quote per gross ton f.o.b. Birmingham district yards, prices to consumers, as follows:

Steel rails.....	\$22.00 to \$23.00
No. 1 steel.....	21.00 to 22.00
Cast-iron borings.....	14.00 to 15.00
Machine-shop turnings.....	14.00 to 15.00
No. 1 cast.....	30.00 to 32.00
Car wheels.....	28.00 to 30.00
Tramcar wheels.....	27.00 to 29.00
Steel axles.....	29.00 to 30.00
No. 1 wrought.....	20.00 to 22.00
Stove plate.....	24.00 to 26.00

St. Louis

ST. LOUIS, Aug. 2.

Pig Iron.—The unauthorized coal strike in the Illinois and Indiana territory with its general effect on business has been felt in the metal industries in an indirect manner, with the result that buying has been still further restricted as a precautionary measure by the foundries which have also reached a point in many cases in which they are not so severely pressed for their products. All the trading done during the week was in small lots for immediate needs. While many of the furnaces are still quoting their prices at \$44, \$45 and \$46 per ton, Birmingham, for No. 2 Southern, according as they desire business, it is understood that at least two interests represented in this market would take business at \$42, though it is uncertain how much would be accepted at that figure. There is not much activity in the future stove business, as dealers are not buying and foundries are pretty well cleaned up on this year's business. The local furnace is getting into production again after a spell of trouble in producing iron of the correct analysis, but is far behind on its contracts. No business at all is being done on Northern iron in this section.

Coke.—No quotations for future delivery are being made, but for immediate or prompt shipment coke \$18 to \$20 per ton is about the figure that would be commanded. The needs of operating foundries are in some instances quite acute and doubtless as much as \$25 per ton on small lots would be obtainable in special cases for spot delivery. No improvement is seen for the near future.

Finished Iron and Steel.—There has been little change and no improvement in the finished products situation. No changes in prices have been made by the leading interests and little or no business is being accepted. The prices quoted rule strong with a heavy unsatisfied demand for various classes of materials. Building materials, tubular goods and tank plates are especially sought, while the scarcity of nails has approached something like a famine. Farm implement business is picking up, but material difficulties are interfering here, too. In all lines collections are reported good. Warehouse steel is moving up to the capacity of the stocks to meet.

For stock out of warehouses we quote as follows: Soft steel bars, 3.94c.; iron bars, 4.50c.; structural material, 4.04c.; tank plates, 4.24c.; No. 10 blue annealed sheets, 7.09c.; No. 28 black annealed sheets, cold rolled one pass, 8.10c.; No. 28 black galvanized sheets, black sheet gage, 9.60c.

Old Material.—The scrap market has been dull and without feature, no disposition to buy or sell appearing. The rolling mills on the East side are not operating, chiefly because of the coal situation, while those on the West side are doing very little at present. The National Enameling & Stamping Co. is reported as preparing to take in some heavy melting steel and some heavy shoveling scrap, but generally this section is doing very little. The Terminal Association list of last week went at fair prices this week, the dealers buying rerolling rails and couplers and knuckles with especial interest, though for what purpose is not known, as there is no trading going on. The Pennsyl-

vania has offered about 1500 tons, closing Aug. 5; otherwise no lists have come out.

We quote dealers' prices f.o.b. consumers' works, St. Louis industrial district as follows:

<i>Per Gross Ton</i>	
Old iron rails	\$32.00 to \$32.50
Old steel rails, rerolling	33.00 to 33.50
Old steel rails, less than 3 ft.	23.00 to 23.50
Relaying rails, standard sections subject to inspection	50.00 to 55.00
Old car wheels	35.00 to 35.50
No. 1 railroad heavy melting steel	22.00 to 22.50
Heavy shoveling steel	21.00 to 21.50
Ordinary shoveling steel	20.50 to 21.00
Frogs, switches and guards, cut apart	24.00 to 24.50
Ordinary bundled sheets	12.00 to 12.50
<i>Per Net Ton</i>	
Heavy axles and tire turnings	\$12.50 to \$13.00
Iron angle bars	27.00 to 27.50
Steel angle bars	21.00 to 21.50
Iron car axles	39.00 to 39.50
Steel car axles	32.50 to 33.00
Wrought arch bars and transoms	31.00 to 31.50
No. 1 railroad wrought	24.00 to 24.50
No. 2 railroad wrought	22.00 to 22.50
Railroad springs	21.00 to 21.50
Steel couplers and knuckles	22.00 to 22.50
Locomotive tires, 42 in. and over, smooth inside	21.00 to 21.50
Cast-iron borings	13.00 to 13.50
No. 1 busheling	19.00 to 19.50
No. 1 boiler, cut to sheets and rings	15.00 to 15.50
No. 1 railroad cast	34.00 to 34.50
Stove plate and light cast	26.50 to 27.00
Railroad malleable	24.50 to 25.00
Agricultural malleable	24.00 to 24.50
Pipes and flues	17.00 to 17.50
Heavy railroad sheet and tank	15.00 to 15.50
Railroad grate bars	26.00 to 26.50
Machine-shop turnings	11.50 to 12.00
Country mixed	17.00 to 17.50
Uncut railroad mixed	20.00 to 20.50
Horseshoes	25.00 to 25.50

Cincinnati

CINCINNATI, Aug. 3.

Pig Iron.—More interest is being shown in future business, and selling of pig iron for last quarter of this year and first quarter of next featured the market in the week. It is estimated that 15,000 tons of Southern iron alone was disposed of in the Cincinnati district for shipment during these periods with booking of Northern iron for first half of next year totaling about 10,000 tons. A melter is reported to have bought from 6000 to 8000 tons of Northern foundry iron for delivery in the first half of next year at \$45, southern Ohio furnace, for the base grade. A 3000-ton sale of Southern iron was made to a nearby melter for last and first quarter delivery at \$42, Birmingham, and several sales of 1000 tons each of Southern iron were made locally for first quarter delivery. Inquiries for prompt iron have fallen off to some extent though some sales for early shipment are noted. Much of the interest shown in the market is from consumers who feel that this is as good a time as any to cover for future requirements and the bulk of the sales are being made for last and first quarters. A Lake furnace is reported to have quoted \$44, furnace, on first half business to some of its regular customers in Indiana territory. Some Southern furnaces have advanced their prices to \$44 to \$45 for the rest of this year, but no sales at these figures are reported in this territory. Southern iron for last half is still available at \$42, Birmingham. Malleable iron is scarce and on an inquiry for 200 tons quotations ranging from \$46 to \$50 were made.

Announcement that the Interstate Commerce Commission had granted the request of the railroads for increased rates was received with interest. One interest in close touch with a Southern furnace estimates that it will add anywhere from \$2 to \$5 a ton to the cost. The new schedules will mean that the freight rates from Birmingham to Cincinnati will be increased by 90c. a ton and from Ironton to Cincinnati by 72c. a ton.

Based on freight rates of \$3.60 from Birmingham and \$1.80 from Ironton, quote f.o.b. Cincinnati:

Southern coke, sil. 1.75 to 2.25 (base price)	\$45.60
Southern coke, sil. 2.25 to 2.75 (No. 2 soft)	46.85
Ohio silvery, 8 per cent sil.	59.80
Southern Ohio coke, sil. 1.75 to 2.25 (No. 2)	46.80
Basic Northern	44.80
Malleable	\$45.80 to 46.80

Coke.—Coke is still in very short supply but local foundries have been able to keep running. Connells-

ville coke is quoted at \$17.50 to \$19.50, ovens, and Wise County at \$17.50, ovens. No quotations are available from the New River district. A Michigan producer has advised dealers that from now on its coke will be billed at \$16.50, ovens.

Finished Material.—Local warehouses report no diminution in the demand for steel products of various kinds, bars and wire products being particularly active. At least one jobber reports that he is getting shipments from mills in fairly good time, but this comes by a very roundabout way. Other dealers state that conditions are about as bad as they have ever experienced, and find it almost impossible, even by offering premium prices, to get steel products for early delivery. A Washington dispatch stating that over 100,000 cars will be released from the coal trade for steel-carrying purposes has raised the hopes of local jobbers and consumers, as they feel that it will give them an opportunity of getting their stocks in shape to meet the demands of their customers. Sheet mills operating in southern Ohio are understood to have available some tonnage for the fourth quarter, and at least one of them is taking on business for that delivery at prices reported to be about 10 per cent above those now in effect. Others have not quoted for this quarter, as they have so many orders on their books at present that they do not know whether they will have any tonnages to offer. The plant of the Andrews Steel Co. at Newport, Ky., will reopen on Monday after being closed for a month pending settlement of wage scales with the employees. A satisfactory adjustment has been made. The sheet mills of the Newport Rolling Mills Co., also down since June 26, will start up later in the week. Prices on all iron and steel products remain unchanged and local warehouses quote as follows:

Iron and steel bars, 5c. to 6c.; structural shapes, 4.50c.; plates, 4.50c.; cold rolled shafting, 6.25c.; steel bands, 6.50c.; No. 10 blue annealed sheets, 7.50c.; No. 28 black sheets, 9 to 10c.; No. 28 galvanized sheets, 10c. to 11c.; wire nails, \$4.50 per keg base.

Old Material.—The scrap market is stiffening up and dealers state that the transportation situation is the only obstacle to an active market. Buying prices on a number of items have been marked up, old car wheels and iron axles, both of which are scarce and in demand, being \$3 higher. Rerolling rails, railroad cast, locomotive tires and malleable cast have been advanced \$1. There is practically no market for borings and turnings and these have been marked down 50c. Dealers' yards are pretty well blocked with stocks awaiting shipment.

We quote dealers' buying prices:

<i>Per Gross Ton</i>	
Bundled sheets	\$14.00 to \$15.00
Old iron rails	27.00 to 28.00
Relaying rails, 50 lb. and up	50.00 to 51.00
Rerolling steel rails	32.00 to 33.00
Heavy melting steel	22.50 to 23.50
Steel rails for melting	24.00 to 25.00
Car wheels	36.00 to 37.00

<i>Per Net Ton</i>	
No. 1 railroad wrought	\$25.00 to \$26.00
Cast borings	11.00 to 11.50
Steel turnings	9.50 to 10.00
Railroad cast	32.00 to 33.00
No. 1 machinery	35.00 to 36.00
Burnt scrap	22.00 to 23.00
Iron axles	36.50 to 37.00
Locomotive tires (smooth inside)	24.50 to 25.50
Pipes and flues	16.00 to 16.50
Malleable cast	24.00 to 24.50
Railroad tank and sheet	16.00 to 16.50

New York

NEW YORK, Aug. 3.

Pig Iron.—A large interest in New Jersey is in the market for about 13,000 tons of foundry iron for the first half of 1921. In general very little is being done about next year's iron. Furnacemen want to see what the freight advances actually add to their costs. What immediately concerns nearly all foundrymen is getting hold of iron they have bought for this year. There are considerable furnace stocks, particularly in the Buffalo district—all sold, but impossible of delivery except in relatively scant amounts. Predictions of higher prices later in the year are still made by fur-

nacemen, all based on the fact of small stocks at foundries, the very small fraction of estimated make of iron in the remainder of the year that is now unsold, the high price of coke, and the higher costs that will be due to freight increases. Nevertheless, some Northern iron has been offered for 1921 at present prices. One factor which is hard to gage is the relation between the iron under contract for this year and the amount of iron foundries will need to take them through the year. Some Virginia iron has been sold for 1921, perhaps a few thousand tons, most of it at \$47, furnace, though to old customers some Virginia furnaces had sold a little iron for next year at \$46 for No. 2. The resale iron at Buffalo, largely bought for the Ford foundry and not needed because of the starting up of the Ford furnace, has now been very largely disposed of. New England embargoes still continue, though foundries there can be reached through the Northern inlet from the West. Some Buffalo iron is going to New York harbor and Long Island Sound points by canal, the Government freight rate being \$3.45. In some cases New Jersey founders have shipped Buffalo iron in this way, transferring the iron from boat to trucks, the total transportation cost reaching nearly to \$6. A little Eastern Pennsylvania iron is sold at \$47.50 for No. 2 plain at furnace. For the small amounts of iron available from Eastern Pennsylvania, the price lately has been \$47 at furnace. Some increase in foundry iron production in Eastern Pennsylvania is expected, principally at Catasauqua and Pottstown. Shipping conditions preclude transactions in export iron, but a 300-ton sale is reported for South America.

We quote for delivery in the New York district as follows:

East. Pa., No. 1 fdy., sil. 2.75 to 3.25.	\$51.80 to \$52.80
East. Pa., No. 2X fdy., sil. 2.25 to 2.75	50.05 to 51.05
East. Pa., No. 2 fdy., sil. 1.75 to 2.25.	48.80 to 49.30
Buffalo, sil. 1.75 to 2.25.....	47.60 to 48.90
No. 2X. Virginia, sil. 2.25 to 2.75....	50.40 to 51.40

Finished Iron and Steel.—The railroad freight rate increase allowed has given strength to the market. It is not that stiffened prices are observed, for there is the usual seasonal dullness, a condition, however, which was encountered in the years of the war. Present guesses are that the increased costs of the raw materials entering into the finished products will for a time be absorbed by producers, but they may be passed on in the event that a decided sellers' market develops. It is felt that as the railroads accumulate resources in the later months of the year, a generous buying movement will follow. Then, in structural steel, general building may possibly find itself in competition with railroad bridge and other structural work. In a word, with low stocks and with most of the effort at the moment directed to securing shipments, the future appears to have nothing in the way of price weakness. A wide range in plate prices still obtains. A quotation for relatively prompt shipment as low as 3.10, Pittsburgh, is claimed; some 1200 tons for export have been sold at 3.60, f.a.s.; about 1000 tons have been sold in the week at 3.40c. Pittsburgh. About 2000 tons for export to England are going at 4c. Pittsburgh, a quarter of the lot already shipped in two weeks after receiving orders. It is likely, however, that a large attractive offering for relatively prompt shipment could be placed at 3.25c. Pittsburgh, although the greater volume of recent business averages closer to 3.50c. Pittsburgh. Steel bars still command 4c. for prompt delivery, though this is now a top and infrequent price, and bands have sold at 6.50c. Pittsburgh. High prices have been obtained for semi-finished steel. Following 12,500 tons of sheet bars rolled on a rail mill for shipment to a sheet mill for conversion for the automobile trade, 500 tons have been sold at \$75 at mill. Only two fabricated steel projects were learned of, one for the Robert Gair Co., Mountville, Conn., 600 tons, and a pier for the Lehigh Valley, North River, 150 tons. The awards of the week include 550 tons for the Central Railroad of New Jersey to the Phoenix Bridge Co., 250 tons for a high school at Hempstead, L. I., to the Bethlehem Steel Bridge Corporation; 325 tons for the York Safe & Lock Co., to Dietrick Bros., Baltimore, and 100 tons for the Chesapeake & Ohio to an un-named fabricator.

We quote for mill shipments, New York, as follows: Soft steel bars, 2.62c. to 4.27c.; shapes, 2.72c. to 3.77c.; plates, 2.92c. to 3.77c., the minimum prices being for indefinite delivery and the highest prices for delivery in a few weeks; bar iron, flats, wider than 6 in., 5.07c. to 5.27c. with half extras; light rounds, squares and flats, 5.77c. to 6.27c. with full extras; and other sizes, 4.77c. with half extras.

Ferroalloys.—There are some indications of a weakness in the prompt delivery price for ferromanganese. There are reports that in this position sales have been made as low as \$200, delivered, and perhaps lower, but these are not confirmed in this market. An explanation is that 75 per cent Japanese ferromanganese has arrived and is offered at \$185, seaboard. Its phosphorus content is reported as 0.35 per cent. It is also a fact that sales for prompt delivery have been made at \$225, delivered. Inquiry for any position is extremely light. Imports in June are officially returned as 5694 gross tons, which is the largest for any month this year, or for any month in some time. It brings the average imports for the first six months to 3544 tons per month. Regarding June imports, it is understood that 2000 tons of these came direct from India. The spiegeleisen market is extremely strong and \$80, furnace, is now quoted. One large Eastern consumer is inquiring for 1000 to 2000 tons, bringing the total to over 3000 tons. There has also been a sale for domestic consumption of 600 tons. The manganese ore market is quiet, with the quotation nominal at 70c. per unit, seaboard. The imports of high-grade ore in June were 80,329 tons, or the largest in many months. This makes the total for the first half of this year 216,542 tons, or 36,090 tons per month, which is in excess of the imports for 1919 at 27,779 tons per month. The ferrosilicon market is very quiet, with quotations from \$80 to \$85 per ton, delivered. Quotations for lump ferrotungsten, guaranteed, are 90c. per lb. of contained tungsten; for the same, not guaranteed, the quotation is 70c. The alloy in powder is 78c. to 85c. per lb. of contained tungsten. Tungsten powder, 96 to 98 per cent, is quoted at 95c. to \$1.05 per lb. All these prices are f.o.b. makers' works. Ferrovanadium is quoted at \$6.50 to \$7 per lb. of contained vanadium in wholesale lots for early delivery, but these are nominal, the alloy being exceedingly scarce. Small lots for prompt delivery are selling above \$7. Ferrocortontitanium, 15 to 18 per cent, is selling at \$200 per net ton in carload lots, at \$220 per ton in lots between one ton and a carload, and at \$250 per ton in lots less than a ton, f.o.b. Suspension Bridge, N. Y.

Warehouse Business.—A slight improvement in transportation conditions is noted by most warehouses. On shipments to New Orleans and Southern ports and cities on or near the coast in New England, the coastwise steamship lines with lower rates than the railroads are giving better service. Prices on galvanized sheets have increased slightly. Some warehouses report heavy inquiries from the large railroad lines, which are unable to secure their immediate needs at mills. Tire steel and toe calk steel will probably be quoted at a slightly increased price after Sept. 1, in view of the increased freight rate. A majority of warehouses are not planning any immediate increase in prices. We quote prices on page 376.

High Speed Steel.—We quote 18 per cent tungsten high speed steel at \$1.25 per lb., New York, with large contracts covering a period of time at less than this price. A recent contract for domestic high speed steel is noted at \$1 per lb., but there seems to be some question as to the tungsten content.

Cast-Iron Pipe.—Difficulties of making and delivering get chief attention. Makers believe they could secure much private business at this time were the factors of traffic congestion and labor shortage remedied. We quote 6-in. and heavier at \$76.30, New York; 4-in., \$79.30, with \$2 additional for Class A and gas pipe.

Old Material.—Prices have taken a rise on several items, there being demand both from the Pittsburgh district and export, one influence bidding against the other. Pittsburgh brokers have offered New York brokers as high as \$27.50, delivered Pittsburgh, for heavy melting steel. One New York scrap firm which contracted for 10,000 tons of steel for export is having difficulty in buying the full amount from dealers as special quality is demanded. Scrap dealers are com-

plaining about the situation caused by the embargoes against the use of hopper cars for scrap, which will not be lifted until Aug. 21, with an increase in freight 10 days later. Stove plate and cast scrap have taken the most marked price advance.

Buying prices per gross ton, New York, follow:

Heavy melting steel.....	\$20.00 to \$21.00
Reroiling rails.....	35.50 to 36.00
Relaying rails, nominal.....	54.00 to 55.00
Steel car axles.....	39.00 to 40.00
Iron car axles.....	43.00 to 44.00
No. 1 railroad wrought.....	29.00 to 30.00
Wrought iron track.....	23.00 to 23.50
Forge fire.....	13.00 to 13.50
No. 1 yard wrought long.....	24.00 to 25.00
Light iron.....	9.00 to 10.00
Cast borings (clean).....	17.00 to 17.50
Machine-shop turnings.....	14.00 to 14.50
Mixed borings and turnings.....	14.00 to 14.50
Iron and steel pipe (1 in. in diam., not under 2 ft. long).....	18.50 to 19.00
Stove plate.....	27.00 to 28.00
Locomotive grate bars.....	27.00 to 28.00
Malleable cast (railroad).....	30.00 to 31.00
Old car wheels.....	39.00 to 40.00

Prices which dealers in New York and Brooklyn are quoting to local foundries, per gross ton:

No. 1 machinery cast.....	\$40.00 to \$42.00
No. 1 heavy cast (columns, building materials, etc.), cupola size.....	39.00 to 40.00
No. 1 heavy cast, not cupola size.....	32.00 to 33.00
No. 2 cast (radiators, cast boilers, etc.).....	29.00 to 30.00

Cleveland

CLEVELAND, Aug. 2.

Iron Ore.—The advance in rail rates on iron ore under the rate increase of 40 per cent in the Eastern territory will apply only to ore shipments from lower Lake docks to the interior furnaces, the Interstate Commerce Commission having decided that the general advance in rates is not to be added to the present rates on ore from the Lake Superior mines to the upper Lake ports. To this extent the action of the Interstate Commerce Commission was a victory for many of the blast furnace interests and mining companies that protested against advancing ore rates and particularly to any advance on the rates from the mines to the upper Lake ports, maintaining that the rates from the mines to the upper Lake ports were already excessive. Furnace companies generally agreed that the railroads were entitled to a reasonable advance in rates from the lower Lake ports to the interior furnaces, but several set up the claim that the rates on ore from the mines to the upper Lake docks that existed before the sharp advance made in June, 1918, should be restored before any other advance was made. The Interstate Commerce Commission rejected the proposal of the Jones & Laughlin Steel Co. that the advance in rate be accomplished by increasing the existing rates by specific amounts in order to preserve existing differential relationships between furnace points. This company proposed an advance of 74c. per ton on ore, and that this specific amount be added to the 1917 rates of the Northern ore railroads and that the increase in rates so collected from shippers be distributed between the Northern roads and the roads carrying the ore from the lower Lake ports to the furnaces. Under this company's plan the rail movement at both ends of the Lake would have made a joint haul, and the object of the plan was to prevent Lake front furnaces from enjoying any undue advantages by reason of not being compelled to pay any portion of the increase in rates from Lake front docks to interior furnaces. The ore rate from lower Lake ports to the Mahoning and Shenango Valleys will be increased from 65c. to 91c. with the advance in rates, and the rate to Pittsburgh will be increased from 91c. to \$1.274, these rates not including the dock handling charges. The present rate for hauling ore from the mines to the upper Lake ports is \$1 a ton and from the Mesaba, Cuyuna and Vermilion ranges to the head of the lakes; 85c. from the Gogebic range to Ashland and from the Menominee and Marquette ranges to Escanaba; 75c. from the western part of Marquette range and 65c. from the eastern part of that range to Marquette. The present rates on the Northern ore roads put in effect in June, 1918, represented an increase of 31c. to 36½c. per ton over previous rates, in some cases the increase being nearly 100 per cent.

The rate from the Mesaba range before the 1918 rate went into effect was 63½c.

Railroads recently asked for a flat increase of 22c. a ton on ore rates from Lake Erie ports to inland furnaces, wanting this flat increase first and the general percentage increase on top of it. The application for the flat increase was disallowed.

Ore shipments during July were 9,638,606 gross tons, a gain of 405,040 tons over June and of 465,000 tons over July of last year. The total movement for the season until Aug. 1 was 26,079,111 tons as compared with 25,181,848 tons during the same period last year.

Although some consumers have notified shippers that they will be unable to take all the ore they have purchased, because of curtailed operations due to the fuel shortage, most furnaces are crowding shippers for deliveries. However, it is believed that many are trying to get as much ore in their yards as possible before the advance in freight rates goes into effect and shippers would not be surprised to receive some orders to curtail shipments as soon as the higher rates are put on. On the other hand, consumers apparently bought ore rather cautiously early in the year, and many were expected to make additional purchases in the latter part of the season. Consequently, it is probable that while some of the furnaces will buy no more ore this season, they will not find it necessary to make downward revision of their present contracts. The priority order on coal shipments to the Northwest is beginning to cause a little but not a marked improvement in the ore shipping situation. Coal shipments have increased, making more cars available for ore, and boats with ore cargoes are not being held up so long for cars as they have been. Every day there are around sixty ore boats at Lake Erie ports waiting for cars to unload. The Baltimore & Ohio railroad has begun to take some ore from Lorain for Pittsburgh. Conditions have also improved in Cleveland, but the dispatch from Toledo is very poor.

We quote delivered lower Lake ports: Old range Bessemer, \$7.45; old range non-Bessemer, \$6.70; Mesaba Bessemer, \$7.20; Mesaba non-Bessemer, \$6.55.

Pig Iron.—A Cleveland selling agency that recently began to book orders for next year sold 6000 tons additional for that delivery in the week, making over 10,000 tons in all. The largest purchase was 4000 tons of foundry iron taken by an Indiana implement manufacturer for the first half. Another sale was of 1000 tons of malleable iron to an Indiana melter for the first quarter. These sales were on the basis of \$45.50 for malleable and \$45 for foundry. The seller is not soliciting business, but is taking contracts from regular consumers who want to buy. No other local interest has taken any pig-iron contracts for next year. There is a limited amount of activity in foundry iron for this year. Two sellers have advanced their price on foundry grades for this year to \$46 for shipment from a Lake and Valley furnace and from Erie and Detroit. Sales have been made at the advance but \$45 is still being quoted in Cleveland. A Burnham, Pa., consumer is inquiring for 10,000 tons of basic iron for the remainder of the year, and the Worthington Pump & Machinery Corporation is inquiring for 13,000 tons, mostly 2.75 to 3.25 silicon foundry iron for its various plants for the last quarter, and some for the first quarter. Some small lot sales of Bessemer iron are reported at \$47.50 and one lot at \$48. A Cleveland foundry is reported to have purchased 2000 tons of southern Ohio Bessemer iron at \$48.40, delivered. Low phosphorus iron is also bringing higher prices, sales being made by a Valley furnace at \$56 to \$57. Furnace companies were able to ship about as much iron as they made in July, but shipments were very unevenly distributed because of the railroad situation.

We quote delivered Cleveland as follows, based on 40c switching charge for local iron, a \$1.40 freight rate from Valley points, and \$5 from Birmingham:

Basic.....	\$46.40
Northern, No. 2 fdy., sil. 1.75 to 2.25.....	45.40
Southern foundry, sil. 2.25 to 2.75.....	48.70
Gray forge.....	41.40
Ohio silvery, sil. 8 per cent.....	60.40
Standard low phos., Valley furnace.....	\$56.00 to 57.00

Coke.—Connellsville foundry is quoted at \$19 to \$19.50, but little is being offered. Consumers are getting only about 50 per cent of shipments on contract.

Finished Iron and Steel.—There is little activity in the finished material market. Shipments have not improved and some mills that are in position to take on orders are not soliciting business because of the large accumulation of finished material. Some consumers are badly in need of steel. The demand for steel bars for early shipment has eased off, but some fourth quarter business is being taken at 3.75c. There is an inquiry for 350 tons of reinforced bars for a bridge at Williamsport, Pa. Demand for plates is light and 3.50c. appears to be the ruling price, although some business is being taken at 3.25c. The Trumbull Cliffs Furnace Co., Warren, Ohio, has an inquiry out for stoves for its blast furnace, which will require 700 tons of steel. The Wheeling & Lake Erie Railroad is inquiring for 2500 tons of rails. Railroads are crowding mills for deliveries on track material.

Bolts, Nuts and Rivets.—Bolt and nut manufacturers state that they will probably have to advance prices to cover their increased costs as soon as the advance in freight rates goes into effect. The expectation of this advance may stimulate buying by railroad companies and car builders. Manufacturers can now make good deliveries on medium sized bolts used in car work, the demand for which has been much lighter than for smaller bolts. New orders about equal output, so that makers are not catching up on deliveries. Rivet specifications are fair, but new business is light. Orders for future delivery are being taken subject to ability to fill and to prices prevailing at the time of shipment.

Sheets.—There is a fair demand in one or two car lots. Most of the business is coming from outside the automobile field. Deliveries have improved on blue annealed sheets and these are being offered for early shipment at 5.50c. Nos. 16 and 14 gages are in good demand and scarce. Automobile body sheets are unchanged at 7.85c.

Cleveland warehouses quote steel bars at 3.27c. to 4.50c.; plates, 3.57c. to 5c., and structural material, 3.70c. to 4.50c.; No. 9 galvanized wire, 4.70c.; No. 9 annealed wire, 4c.; No. 28 black sheets, 8.50c.; No. 28 galvanized, 9.50c.

Old Material and Scrap.—The market is firm but inactive. Sales of heavy melting steel are reported at \$27 to \$27.50 to two Valley mills, but a Cleveland mill that does not require selected scrap is understood to have purchased a round lot from several dealers at considerably lower prices. Owing to the fact that it is almost impossible to move scrap when sold and to a belief by dealers that prices may go higher many dealers are making little effort to take orders.

Dealers quote delivered consumers' yards in Cleveland and vicinity as follows:

Heavy melting steel.....	\$24.75 to \$25.25
Steel rails, under 3 ft.....	28.00 to 28.50
Steel rails, rerolling.....	32.00 to 32.50
Iron rails.....	32.00 to 33.00
Iron car axles.....	41.00 to 42.00
Steel car axles.....	36.00 to 37.00
Low phosphorus melting scrap.....	26.50 to 27.00
Cast borings.....	15.75 to 16.25
Machine shop turnings.....	12.00 to 12.50
Mixed borings and short turnings.....	15.75 to 16.25
Short turnings for blast furnaces.....	15.75 to 16.25
Compressed steel.....	19.50 to 20.00
Railroad wrought.....	28.00 to 29.00
Railroad malleable.....	32.50 to 33.00
Steel axle turnings.....	19.50 to 20.00
Light bundle sheet scrap.....	14.00 to 14.25
Drop forge flashings over 10 in.....	18.50 to 19.00
Drop forge flashings under 10 in.....	18.50 to 19.00
No. 1 cast.....	41.00 to 42.00
No. 1 busheling.....	17.50 to 17.75
Railroad grate bars.....	32.00 to 33.00
Stove plate.....	32.00 to 33.00
Cast-iron wheels.....	37.00 to 38.00
Pipes and flues.....	24.50 to 25.00

The second quarter reports of the Otis Steel Co. shows net earnings, before taxes, of \$1,324,558, compared with \$1,089,118 in the first quarter. The balance showed an increase from \$820,389 to \$1,026,768. Net earnings for the first six months, after estimated Federal taxes, amounted to \$1,536,291, equivalent to nearly five times the requirements for six months' dividends on the amount of preferred stock outstanding.

The annual outing of the employees of the Homestead works of the Carnegie Steel Co. was held at Kennywood Park on July 31. The day had been declared a holiday and most departments of the works were idle.

Philadelphia

PHILADELPHIA, Aug. 3.

Speculation is rife as to how much iron and steel prices will be raised, if at all, because of the increase in freight rates. Inquiry this week has been more for raw materials, pig iron and scrap, than for finished steel. One pig iron consumer has an inquiry for nearly 30,000 tons for steel castings. The quality of coke received grows worse and much iron too high in sulphur and phosphorus is being made. However the furnaces do not dare complain for fear they will get no coke at all. As high as \$20, oven, has been asked for furnace coke. The car situation is no better. Evidences of railroad buying on the strength of the freight rate increase have already been seen. In fact the heavy inquiry above mentioned is doubtless a result.

Pig Iron.—The largest inquiry before the trade is that of the Standard Steel Works Co., Philadelphia, for 13,000 tons of basic, 16,000 tons of low phosphorus and 700 tons of 35 per cent spiegeleisen. The Pennsylvania Railroad to-day placed an inquiry for 4300 tons of foundry iron, for fourth quarter delivery to Altoona, Pa., of which amount 800 tons is low silicon and 500 tons high manganese. The scarcity of prompt iron is more marked than ever, particularly of 2.25 to 2.75 silicon iron, because of the difficulty of securing good coke for making the higher silicon grades. Sellers do not know where they can secure even single carloads direct from furnaces. The only spot sales are of resale material. Only two producers have sold for 1921—the leading Virginia company which has disposed of several thousand tons and a Buffalo furnace. Most are wary of quoting for this period because of the uncertain future. One maker of foundry iron sold 500 tons for 1921 at \$48, furnace, for 2.25 to 2.75 silicon, then seeing the big demand at this price and fearing the future, promptly withdrew further quotations. Though eastern Pennsylvania iron is nominally quoted at \$47, base, sales are ranging from \$48 to \$50 for this grade on what little is sold. A sale of iron, silicon 3.65, was made at \$55, furnace. Virginia irons are selling for prompt delivery at practically the same figures as eastern Pennsylvania, or at about \$48, base. The Colonial furnace, an important producer of low phosphorus iron, blew out yesterday because of mine labor troubles. This will tend to make this grade of iron advance. The new freight rates will increase the cost of making pig iron \$1.85 to \$5 a ton, it has been variously estimated by furnace representatives, due to the increased costs of hauling raw materials to the furnaces. Basic is nominally quoted at \$45 in absence of sales; standard low phosphorus at over \$56; copper-bearing low phosphorus at \$53. The Philadelphia & Reading has also made inquiry for iron.

The following quotations are for iron delivered in consumers' yards in Philadelphia or vicinity, except those for low phosphorus iron, which are f.o.b. furnace:

East. Pa. No. 2 plain, 1.75 to 2.25 sil.	\$47.90 to \$50.10
East. Pa., No. 2 X, 2.25 to 2.75 sil.	49.15 to 51.35
Virginia No. 2 plain, 1.75 to 2.25 sil.	49.10 to 50.10
Virginia No. 2 X, 2.25 to 2.75 sil.	50.35 to 51.35
Basic deliv. eastern Pa.	44.40 to 44.80
Gray forge	43.00 to 44.00
Standard low. phos. (f.o.b. furnace)	54.00
Malleable	48.10 to 48.60
Copper bearing low phos. (f.o.b. furnace)	53.00 to 55.00

Ferroalloys.—A few hundred tons of ferromanganese have been sold, the largest tonnage being 200. For last half the price is \$200; for spot, \$225. A leading furnace has 1000 tons of this grade piled in the yards because of lack of cars. Spiegeleisen is quoted at \$75 for last half. The tendency of ferromanganese is downward in price; of spiegeleisen, upward.

Finished Steel.—Very little activity prevails. The Pennsylvania, the Baltimore & Ohio and the Norfolk & Western railroads are reported about to come into the market for considerable tonnages of plates, shapes and bars. The requisitions have been in the hands of their purchasing agents for some time, but the recent freight rate increase will bring them to action, it is promised. The Pennsylvania Railroad is about to place an inquiry for 2000 tons of car plates. Evidences are that the

leading steel interest will soon be taking more plate orders which heretofore have been taken by independents. A leading independent plate maker reports that options have been accepted on 16,000 tons of ship tonnage, the greater portion of which the company knows will result in business. The same company reports that locomotive orders continue to be the leading feature of the market. Plates are again a trifle weaker, considerable being obtainable at 3.25c., Pittsburgh, with 3.50c. the average price and with sales made as high as 3.75 and 4c. One sale of plates was made to Cuba at 3.50c., Pittsburgh. Another sale was made to India. A sale of shapes was made at 3c., Pittsburgh. The range extends to 3.75c. The Victor Talking Machine Co., Camden, N. J., will need 300 tons of structural material for its new power house on which steel makers are figuring. Bars are firm at 4c. There is a trifle less demand for blue-annealed sheets. They range from 5.50 to 6c., Pittsburgh.

Old Material.—There is a decidedly better feeling, which, however, is not yet reflected in higher prices, no change being recorded over a week ago. British interests which ordered American heavy melting steel a few weeks ago have suddenly found scrap cheaper at home and are accordingly canceling contracts. To do so, the American brokers and dealers are paid so much a ton for the canceled orders. The Americans also make extra on these deals because of the exchange rate change. The steel which they bought for shipment abroad they will dispose of in the Pittsburgh district where this grade commands \$27 or even \$27.50. Seven consumers in the Pittsburgh district have been trying to secure scrap in the Philadelphia district, having been disappointed in deliveries of scrap which they had already contracted for.

No. 1 heavy melting steel	\$23.00 to \$23.50
Steel rails rerolling	35.00 to 36.00
No. 1 low phos. heavy 0.04 and under	30.00 to 31.00
Car wheels	40.00 to 42.00
No. 1 railroad wrought	33.00 to 34.00
No. 1 yard wrought	26.00 to 27.00
No. 1 forge fire	17.50 to 18.00
Bundled skeleton	17.50 to 18.00
No. 1 busheling	20.00 to 21.00
No. 2 busheling	17.00 to 18.00
Turnings (short shoveling grade for blast furnace use)	17.00 to 18.00
Mixed borings and turnings (for blast furnace use)	16.50 to 17.50
Machine-shop turnings (for rolling mill and steel works use)	17.00 to 18.00
Heavy axle turnings (or equivalent)	20.00 to 20.50
Cast borings (for rolling mills)	20.00 to 21.00
Cast borings (for chemical plants)	21.50 to 22.50
No. 1 cast	38.00 to 40.00
Railroad grate bars	30.00 to 31.00
Stove plate (for steel plant use)	26.50 to 27.50
Railroad malleable	28.00 to 29.00
Wrought iron and soft steel pipes and tubes (new specifications)	21.00 to 22.00
Iron car axles	45.00 to 46.00
Steel car axles	42.00 to 44.00

San Francisco

SAN FRANCISCO, July 27.

In spite of the car shortage and the general conditions unfavorable to the delivery of Eastern steel products, important building projects continue to be planned in the vicinity of San Francisco. Several large corporations, notably the oil companies and railroads, are to spend many millions in enlarging their facilities.

Bars.—The coast plants are operating steadily and notwithstanding new business are getting ahead on old contracts. The general outlook is improving except in the matter of cars. Bars continue to be quoted at \$4.75.

Structural Steel.—The work on the California State building in San Francisco has been suspended owing to the delay in the arrival from the East of light sizes of structural steel required for floor beams. The Shell Oil Co. will double the capacity of the plant at Martinez, Cal. The Southern Pacific plans to build an iron foundry, rolling mills, steel foundry, general stores and shops at Sacramento.

Wrought Pipe.—Shipping conditions make for curtailed construction work. Local agents are making strenuous efforts to expedite water shipments, but the car shortage handicaps deliveries to the seaports. Coast stocks are depleted.

Cast Iron Pipe.—There is quite a sprinkling of small inquiries, though some orders are not being placed on account of high prices. General conditions are good, but consumers complain of delayed shipments. The base price is \$93.80 f.o.b. San Francisco for 6-in. and larger, Class B and heavier.

Pig Iron.—The price is \$59 to \$60 per gross ton, f.o.b. San Francisco. There has been lately quite a lot of pig iron sold and delivered in San Francisco which formerly went to Japan.

Coke.—Scarcity has now been relieved as far as the shipments from Washington are concerned. The price on this is \$23.50. Very little Eastern coke is being shipped here except on old contracts.

Old Material.—Steel scrap is being sold at \$30, but some large concerns claim to be getting all they want and are accumulating a surplus, at \$25.50 per net ton. Cast iron scrap sells at \$47.50 per net ton.

SHEET SHORTAGE

Consumers in Canada Have Great Difficulty in Covering Requirements

TORONTO, ONT., Aug. 2.—The demand for iron and steel throughout the Dominion continues brisk and in most cases dealers are being hard pushed for deliveries on certain lines, as the amount of material at their disposal is by no means equal to the demands made upon them. Cold-rolled steel has been scarce for some time and dealers report that no improvement in regard to deliveries of additional supplies of this material is in sight; in fact, the situation appears to be getting worse and numerous consumers are clamoring for supplies. The demand for bar iron and steel is well maintained and dealers are disposing of large quantities of these commodities. Reinforcing bars are receiving considerable attention, but up to the present dealers have been in a position to take care of all demands made upon them, although stocks are rapidly being depleted, and unless a general improvement in deliveries is speedily forthcoming, there will probably be a shortage. All prices are showing strength and some lines of iron and steel have recently shown increases. Steel hoops have recently been marked up to \$6.75 and angles to \$5.75 per 100 lb. Prices Toronto dealers are quoting on iron and steel are as follows:

Per 100 pounds	
Steel bars, base	\$5.50
Common bar steel, 3/16-in. and lighter	6.00
Common bar steel, 1/4-in. and heavier	5.50
Common bar iron, 3/16-in. and lighter	6.00
Common bar iron, 1/4-in. and heavier	5.50
Cold rolled steel, base, rounds	7.00
Cold rolled steel, square, flats and hexagon	7.50
Reinforcing bars	5.50
Steel hoops	6.75
Angles	5.75
Structural angles	6.25

The famine in black and galvanized sheets which has been under way in Canada for the past three or four months continues to hold the market in its grip. Some dealers say that new material is being received from time to time, but this is by no means sufficient to take care of the heavy orders they have on their books, and is being doled out in small quantities to consumers whose needs appear to be the most urgent, and by the time a few of these have been taken care of the supply on hand is exhausted and there are still a large number of customers who are forced to wait until another supply arrives. The shortage has now become so acute that manufacturers are unable to get anything like enough sheets to keep their plants going at full time and some are complaining that they have been forced to cease the production of certain articles because they are unable to secure enough raw material in the line of sheets. Local dealers state that they have large orders with the mills for both black and galvanized sheets, but these are unable to make deliveries. The shortage of proper shipping facilities, especially as regards cars, is one of the reasons United States mills are unable to fill their contracts with Canadian

dealers. Another reason for the shortage of sheets is that Canadian producers have been held up on account of the shortage of fuel and raw materials as well as labor difficulties and have not been in a position to take care of their orders. Toronto dealers are quoting the following prices on sheets and plates:

Black sheets, No. 28, \$9.65; galvanized sheets, No. 28, \$11.45 to \$12.70, Apollo, \$11.45 to \$12.85 per 100 lb.; corrugated sheets, No. 28, galvanized, \$10.50; painted, \$8.50 per 100 sq. ft.; plates, 3/16-in., \$7.00; 1/4-in., \$6.50 per 100 lb.

An extra is now charged on galvanized sheets, 10 1/2 oz., and 28 gage when shipped out in sheets 3 ft. wide. The extra charged over prices shown above is 20c. per 100 lb. Other gages show no change for different widths.

Trading in iron and steel scrap materials continues quiet. About the only demand at present is from gray iron foundries, some of which have recently resumed operations and find themselves short of such scrap as heavy melting steel and cast iron. The demand for other lines is very light. Present dealers' buying prices are as follows:

	Per Gross Ton
Heavy melting steel	\$20.00
Steel turnings	12.00
Machine shop turnings	12.00
Cast borings	12.00
No. 2 busheling	12.00
Pipe wrought	15.00
Bundled sheet scrap	8.00
Hydraulic compressed sheets	11.00
Heavy axle turnings	15.00
Boiler plate	18.00
Axes, wrought iron	20.00
Balls	19.00
No. 1 machinery cast	34.00
Malleable scrap	24.00
Car wheels, iron	30.00
Steel axles	25.00
Stove plate	28.00
No. 1 wrought scrap	20.00
Plate and shape shearings	20.00
Heavy breakable cast	20.00

GERMAN SHIPYARDS BUY

Open Dollar Credits on Large Order—Japan Shows Marked Recovery

Except for inquiries for ship plates, shapes and some bars, the European markets have quieted down from their recent activity. British buyers, who are evidently finding satisfactory prices on tonnages offered by Belgian speculators are unwilling to place orders unless a year or more credit is extended. Orders being received at present from England, France, Holland, Italy and Sweden are in general small. One exporter in New York, for the month of July, booked orders totaling about 4000 tons, ranging in size from 15 tons to 400 tons, a majority of these being for ship plates, shapes and bars. Buyers are slow to open dollar credits. An exporter dealing with Europe states that he has more than 14,000 tons of material on his books and is waiting only for the letters of credit to be opened in order to ship.

A Belgian banking syndicate is negotiating with export concerns in the United States for 22,000 tons of ship plates, shapes and bars for shipment to France and Italy. The first inquiry for this material was for 11,000 tons, but on receiving satisfactory quotations the specifications were doubled. A British export house in New York is negotiating with mills to roll a large tonnage of wrought iron pipe to British specifications for shipment to Australia. The order, which will amount to several hundred thousand dollars, is still pending.

An order from German shipyards for ship plates and shapes, mentioned in THE IRON AGE, July 22, has been placed through a New York export company. The material, which is for three German shipyards, is for 16,000 tons, about 60 per cent plates and 40 per cent shapes. When the order was first received it was accompanied by an offer to open a mark credit, which was refused. A dollar credit was then opened with a New York bank by one of the shipyards. The cables from the other two were slightly mutilated, causing a delay. The material is understood to be for ships to be constructed for Swedish interests.

Prices prevailing in Japanese markets on July 29, compared with prices for the same material prevailing about June 23, show a rapid recovery from the

depression of the past few months. The yen is now quoted at 51.75c. The following table shows the rapid increase in prices:

	June 23	July 29
	Yen	Yen
Steel bars	130	160
Shapes	140	200
Plates	130	160
Sheets, 1/16 to 1/4	150	260
Sheets, fine gage	210	290
Sheets, galvanized	380	500
Tin plate	16	18
Galvanized wire	119	240
Wire nails, per keg	17	18
Pig iron	80	90

Toward the end of June, iron and steel prices reached their lowest mark and began to ascend, partly because of improved money conditions, which permitted buyers, who had been willing to accept material ordered to fulfill their obligations. The buying syndicate of importers and iron and steel merchants of Japan, formed in May, is functioning satisfactorily and has probably been partly responsible for the stiffening in prices.

Youngstown

YOUNGSTOWN, Aug. 3.

Valley plant schedules continue with little change, averaging between 70 and 75 per cent. Modification of Interstate Commerce Commission Service Order No. 9, amended to change the height limit of cars which may be loaded in any direction from 36 to 38-in. inside measurement, affords partial relief from the car stringency. This change has added about 15,000 cars to those available for the steel industry. Representatives of the industries sought to have the commission exempt cars measuring up to 40-in. from the ruling. District industries are gratified by the action of the commission in promising to send inspectors to the territory west of the Mississippi River to investigate the claim that roads there have 70,000 open-top cars in excess of their own equipment.

Total movement of cars on all roads entering this territory for a typical 24-hr. period was 18,201, or 800 more than on the corresponding day the year before and 3,800 more than a month ago. The railroads in this territory report 87 per cent of their normal road crews, 50 per cent of their usual switching crews and 92 per cent of their normal repair force.

Youngstown Sheet & Tube Co. is operating all departments on a curtailed basis of about 75 per cent of normal; Republic Iron & Steel Co. and Sharon Steel Hoop Co. report 85 per cent; Trumbull Steel Co., 75 per cent; Brier Hill Steel Co., 70 per cent; Carnegie Steel Co., 75 per cent in Sharon, Farrell and New Castle plants and 55 per cent for Youngstown works.

Newton Steel Co. has ten mills in commission, producing one-pass black and highly finished sheets for the automobile industry at the yearly rate of 60,000 tons, in the proportion of 60 per cent of highly finished output and 40 per cent of black sheets. Because of the exceptional demand for the best grade sheets, the company anticipates entering such production on a larger scale.

At Farrell, Pa., the hot mill department of the American Sheet & Tin Plate Co. resumed in full Sunday evening, after an idleness of two weeks.

The Youngstown Sheet & Tube Co. has started its new lapweld tube mill, giving it seven of that type and four buttweld. The new unit has a daily production approaching 200 tons.

Makers report no tendency toward cancellation of orders, but sustained insistence on the part of consumers for deliveries. Effect of the prolonged interruption of normal rail service is discouraging some heavy steel consumers from going forward with planned enterprises. Producers, however, are optimistic, in view of strong export demand and outlook for bumper harvests, which ordinarily react beneficially on the basic industries.

On one day recently, 97 trucks were waiting their turn in a department of a local mill to get material. At another plant, 50 trucks were standing in line,

to be loaded. Curtailment of operations in the rubber industry at Akron has enabled a large number of trucks to be diverted to this district for steel loading. Producers say it is a day-to-day struggle, however, to obtain shipping accommodations.

Valley interests, it is stated, are being able to ship steel to Pittsburgh to regular customers of the Steel Corporation by using east-bound empty coal cars destined for the mines by way of that city. Vigilance of shippers in locating empty west-bound box cars has resulted in a substantial movement of pipe, bars and other steel products seldom moved in box cars.

Sales departments are devoting their attention primarily to making allotments of material that is sent from yards rather than in creating sales. Inquiries for all grades of steel, finished and semifinished, come into the district with regularity.

Increased Charge for Hauling Slag

Through an increase by the railroads of 44 cents per ton on the movement of slag and 25 cents a ton for hauling coarse refuse for wasting, about \$1,000,000 annually has been added to furnace and mill operation costs in the Mahoning Valley. The advanced rates affect the handling of slag not turned over to commercializing plants for conversion and all miscellaneous refuse. Unless modified by the tariff committee of the Central Traffic Association of railroads, the tonnage rate for wasting both slag and miscellaneous refuse from steel plants will be 69 cents. This rate compares with 25 cents per ton for wasting slag and 44 cents per ton for removing coarse refuse in effect since the last increase about two years ago.

The manufacturers had agreed to accept an increase to 35 cents a ton for slag and 60 cents a ton for other refuse, but the carriers rejected their proposal and decided upon a uniform rate for all classes of mill by-products turned over for wasting and fixed the highest rate so far imposed. Manufacturers have 30 days to file a protest.

Output of slag from furnaces in the Mahoning Valley is about 6,000,000 tons a year, with all stacks producing normally. Added to the slag output is a large accumulation of cinders, ashes and other mill refuse. The railroads receive a rate for the movement of slag to commercializing plants based on regular revenue tariff, slag destined to such plants being classed as commercial commodity.

The carriers claim the old rates do not meet the cost of operating slag and refuse trains and that the new charges will also be below cost.

When operating at full capacity, the furnaces of the Valley require 280 cars per day for movement of slag and waste. No slag is turned over to the railroads by the Brier Hill Steel Co. or by the Carnegie Steel Co. plants in the Youngstown district. The Ohio works of the Carnegie company has a reduction plant of its own, while the Brier Hill company disposes of its slag to a commercial concern.

Part of the slag produced by the Youngstown Sheet & Tube Co. is sent to a commercializing plant and the remainder turned over to the railroads for disposition.

Figures furnished by the railroads show that 140,000 carloads of slag were moved from plants in the Youngstown and Pittsburgh districts in 1919, 50 per cent from each district.

The New York Central recently purchased a farm at Hartford and the Erie property at Leavittsburg, both in Ohio, for dumping slag and refuse.

The June report of the Michigan State Labor Department, which has offices located in 12 of the principal industrial cities of the State, shows that jobs still exceed the number of men available. In the month 3220 employers asked for 10,230 men and 1481 women, while but 9212 men and 908 women applied. There were 8487 positions filled by men and 808 by women. The Briscoe Motors Corporation, Jackson, Mich., has been employing Indians from the Upper Peninsula of Michigan, educated at one of the Government schools.

British Iron and Steel Market

Minimum Prices for Rails and Sheet Bars—Large Sales of American Sheet Bars

(By Cable)

LONDON, ENGLAND, July 31.

The domestic demand for Cleveland pig iron is strong and export business is still refused. August allocations to Scotland have been increased over those for July. Cochrane & Co., Ltd., are blowing in another Cleveland furnace. The shortage of raw material is lessening and other furnaces will probably be operating before the end of the year. Prices are unchanged. The inquiry for hematite iron for export is less but makers are fully sold and there is little iron available. Prices are unaltered. It is understood that the Japanese are buyers of Tata pig iron, proposing direct deliveries to the United Kingdom.

The scrap market is weakening and it is more difficult to sell. The ore market is dull and the best Rubio is quoted at 52s., ex-ship, Tees.

Demand for steel is quiet and the domestic inquiry is affected by the holidays. Rail prices have been advanced to a minimum of £25 and fish plates to a minimum of £30, the increases being long overdue since quotations were far below those for billets.

The Sambre-et-Moselle works are now rolling half rounds and are offering billets, blooms and sheet bars, the latter at £21 10s., f.o.b. Antwerp. If full coal supplies are received, it is expected that rollings will be as per pre-war program by the end of the year.

It is reported that domestic consumers have placed large orders for sheet bars in America. The Welsh sheet and tin plate bar makers have fixed minimum price at £23 10s., delivered, after sellers had done business at £21. This should stiffen the tin-plate market. The tin-plate market is inactive with 20 x 28's sold at 122s., prompt delivery, f.o.t. The galvanized sheet market is weaker with sellers quoting £48 for No. 24g.

We quote per gross ton except when otherwise stated, f.o.b. maker's works, with American equivalent figured at \$3.72 for £1, as follows:

Ship plates	.....	26	0 to 34	0	\$96.72 to \$126.48
Boiler plates	.....	28	10 to 37	0	106.02 to 137.62
Tees	.....	20	10 to 33	0	76.26 to 122.76
Channels	.....	25	15 to 33	5	95.85 to 123.69
Beams	.....	25	10 to 32	0	94.86 to 119.04
Round bars, $\frac{3}{4}$ to 3 in.	.....	28	0 to 33	10	104.16 to 124.62
Rails, 60 lb. and up	.....	25	0 to 27	0	93.00 to 100.44
Billets	.....	25	0 to 26	0	93.00 to 96.72
Sheet and tin plate bars,					
Welsh	.....	23	10		87.42
Galvanized sheets, 24 g.	.....	49	0 to 50	0	182.28 to 186.00
Black sheet, 24 g. to 26 g.	.....	50	0 to 54	0	186.00 to 200.88
Tin plate, base box*	.....	3	1 to 3	2	11.34 to 11.53
Steel hoops	.....	38	15 to 39	0	144.15 to 145.08
Cleveland basic iron	.....	11	7½		42.31
West Coast hematite	.....	14	15		53.87
Cleveland No. 3 foundry (export to allies)	.....	10	5		38.13
Ferrromanganese	.....	35	0 to 40	0	130.20 to 148.80
Coke	.....	3	2½		11.67

*Prompt delivery; for Aug.-Sept., 58s. (\$10.78); December, 54s. (\$10.04).

Steel Accumulating in Second Hands—Scarcity of Foundry Iron Pronounced

LONDON, ENGLAND, July 20.—The general position of the Cleveland pig iron market remains unaltered so far as supply and demand are considered. The scarcity of foundry grades is still pronounced, although there has been recently less pressure for deliveries owing to the holiday period in Scotland. Output is still restricted, and there are no signs of producers being able to relax the ban on exports. Prices continue at 230s. for No. 1 Cleveland and 217s. 6d. for No. 3, G.M.B. These apply, of course, to home consumption only, and in the absence of supplies, export quotations are impossible. The proposed increase in transporta-

tion is again bringing some uncertainty in Cleveland pig iron prices, and some makers are insisting on the insertion in contracts of a clause to cover any advance in the cost of carriage and raw materials.

In addition to this, there is also talk of a further increase to meet recent advances in costs of production. The policy, however, of the Cleveland iron masters has been to keep the price down, and this is borne out by the fact that Cleveland iron is cheaper than any other iron of a similar description in the country. If it can be avoided there will be no advance, for it is recognized the time has arrived when a halt must be called to the cycle of advancing prices. It must be admitted, however, that inquiry from abroad is not so keen as it was, and even if the iron were obtainable Swedish users are not inclined to pay the present price, and are doing the best they can for the time being on their own home production.

So far American competition in Scandinavia does not seem to have amounted to anything important, partly owing to buyers' disappointment in the failure of sellers to fulfill their contracts on time owing to transport and other difficulties in the United States.

In regard to hematite it is still difficult to do business either for the near or forward delivery, makers being heavily booked, some indeed until the end of the year. In view of the pressure on home requirements there is little to spare for export, but the inquiry from overseas is at present rather quiet. Prices remain at 260s. for East Coast Mixed Nos. or 265s. for export for Belgium, Italy and France.

In finished iron and steel the situation is somewhat puzzling, but the opinion is now practically unanimous that the "crest of the wave" in regard to high prices has been reached. For weeks the accumulation of certain classes of material in second hands has been growing, and are offered at prices well below makers' quotations. As a consequence there are therefore not infrequently two prices in the market, that is to say, the manufacturers' and the dealers'. The majority of manufacturers, however, claim to have sufficient orders on their books to keep them going for two or three months. Meanwhile, however, in the Straits it is surprising that buyers are reluctant to commit themselves. More is being heard of American competition but the traffic congestion there makes business somewhat difficult to negotiate. Offers have been received from Canada of fairly large lines of plates for shipment in the second half of this year at around £25 per ton, c.i.f., United Kingdom.

It appears that an arrangement has been entered into by which Guest, Keen & Nettlefolds have acquired the business of Bayliss, Jones & Bayliss of Wolverhampton. This will add to the resources of the former who have been gradually expanding since the formation of the company in 1900.

It is understood that transactions between the Ministry of Shipping and the syndicate which purchased the National Shipping Yard at Chepstow have resulted in an understanding being arrived at on the general principle of the contracts entered into being adhered to. It may be remembered that the syndicate asked for a revision of the contract, as it had been entered into on their part on the understanding that the excess profits duty would be taken off. It seems that the Ministry of Shipping repudiated this and that eventually the contention was withdrawn. The government, it is reported, have refused to give any concession so far as trade is concerned but, realizing that the purchases may have been based upon a miscalculation on the subject of the excess profits duty, they are prepared to meet the buyers by way of extended time for completion.

A booklet telling the story of how the citizens of New York organized to prevent a small group of men from tying up the delivery of freight movements to and from shipping has been published by what is known as the Citizens Transportation Committee, 233 Broadway, New York. It is mentioned as telling a story that is of interest to business and commercial interests of other communities. A copy can undoubtedly be had by sending to the committee at the address named.

Pittsburgh Iron and Steel Markets

(Continued from Page 349)

Old Material.—The market still exhibits a very strong tone, partly because of the increased interest of a number of melters in the market, but chiefly because of the increased reluctance of dealers to take on orders delivery of which cannot be made before Sept. 1, except at prices which cover the higher freight charges. The market has moved up quite sharply on machine shop turnings, sales of which from 5000 to 6000 tons are noted to a Pittsburgh district sheet maker, at prices ranging from \$13.50 to \$15. This grade is not obtainable now in quantity at much below \$15. A sale of 2000 tons of cast iron borings is noted at \$19, delivered, and \$35 has been done on a round tonnage of heavy breakable cast. Some large export business is reported on the East in some desirable kinds of heavy melting steel, including railroad knuckles, couplers, springs and in structural shapes. Some of this business includes sales to England at the price of \$42 per ton, Liverpool. These purchases have had considerable influence upon primary markets. Shipping conditions in this district are unimproved and permits issued by the Pennsylvania Railroad are for only limited periods.

We quote for delivery to consumers' mills in the Pittsburgh and other districts that take Pittsburgh freight rates as follows:

Heavy melting steel, Steubenville, Follansbee, Brackenridge, Monessen, Midland and Pittsburgh, deliv.	\$27.00 to \$27.50
No. 1 cast (for cupola).....	41.00 to 42.00
Rerolling rails, Newark and Cambridge, Ohio; Cumberland, Md.; Franklin, Pa., and Pittsburgh.....	36.00 to 37.00 23.00 to 23.50
Bundled sheet sides and ends, f.o.b. consumers' mills, Pittsburgh dist.....	14.00 to 15.00
Railroad knuckles and couplers.....	29.50 to 30.00
Railroad coil and leaf springs.....	29.50 to 30.00
Railroad grate bars.....	30.00 to 31.00
Low phosphorus melting stock (bloom and billet ends, heavy plates) $\frac{1}{4}$ in. and heavier.....	32.00 to 32.50
Railroad malleable.....	32.00 to 33.00
Iron car axles.....	50.00 to 51.00
Locomotive axles, steel.....	36.00 to 37.00
Steel car axles.....	36.00 to 37.00
Cast iron wheels.....	42.00 to 43.00
Rolled steel wheels.....	29.00 to 30.00
Machine shop turnings.....	14.50 to 15.00
Sheet bar crop ends (at origin).....	28.00 to 28.50
Heavy steel axle turnings.....	21.50 to 22.00
Short shoveling turnings.....	18.50 to 19.00
Heavy breakable cast.....	35.00 to 35.50
Stove plate.....	31.50 to 32.00
Cast iron borings.....	19.00 to 19.50
No. 1 railroad wrought.....	31.00 to 32.00

A New Alloy

M. Guillaume, the inventor of the alloy Invar, which was patented in 1897, and which, on account of its possessing a very low coefficient of expansion, is largely used in the manufacture of watches, clocks, and scientific instruments, has discovered another alloy, which he has called Elinvar, says the London *Ironmonger*. Invar is a nickel iron alloy, containing 56 per cent nickel and 2 per cent carbon, and the new alloy is of the same general character, and was discovered by M. Guillaume in his search for an ideal spiral compensation which would work under any temperature.

Foster E. Fike has been appointed western sales manager of the Russell, Burdsall & Ward Bolt & Nut Co., with headquarters at Chicago, to succeed James F. Donahue, who resigned to become vice-president and general manager of the Foster Bolt & Nut Co., Cleveland. Mr. Fike was born at Milledgeville, Ill., on Aug. 11, 1881, and entered the employ of the Government in 1900 in connection with the construction of the Illinois and Mississippi River Canal at Rock Falls, Ill. A year later he entered the bolt and nut plant of Cobb & Drew, in that city, which was acquired by Russell, Burdsall & Ward in 1907. He remained at Rock Falls until his recent appointment as western sales manager, having been assistant manager of the plant during the past ten years.

New England Foundries Short of Coke

BOSTON, July 20.—In former years some of the largest foundries in New England always carried large coke reserve stocks. To-day there is no such thing. A great majority of the foundries have not more than one month's supply on hand, and in some instances not more than a week's. The latter are simply struggling along on the edge of an enforced shutdown. The situation is not spotty, but general throughout New England.

Present indications are the coke supply situation will continue strained for several months. The New England Coal & Coke Co., during and since the war, has supplied the bulk of foundry coke consumed. To-day it is operating but 260 of its 400 ovens and producing not more than 1400 tons average per day. Of this 1400 tons, between 500 and 600 tons are shipped to foundries, the rest being consigned to public utilities that must be kept operating notwithstanding the shortage of bituminous.

The New England Coal & Coke Co. could operate more ovens provided it could secure coking coals. Recently it paid \$20.90 per ton for coal alongside Everett, Mass., as compared with \$20.90 per ton, its delivered price on foundry coke where the freight does not exceed \$2.40 per ton. With bituminous selling at \$17 to \$18 per ton f.o.b. Hampton Roads, which means \$21 to \$22 alongside Boston, it does not look as though coke will be more plentiful and cheaper in the near future.

The Providence Gas Co. is having its difficulties in securing coking coals even at going market prices and recently was obliged to cut its production 40 per cent. Some Connellsville coke is selling to and finding its way into New England, but general transportation conditions are such that the uncertainties attending the purchase of such coke are so great as to discourage any pronounced buying movement.

Great Northern Iron Ore in 1919

The 13th annual report of the trustees of the Great Northern Iron Ore Properties has just been issued for the year ended Dec. 31, 1919. The receipts were \$5,844,249, and there were two distributions of \$2 per share, or \$3,000,000 each. Counting the amount carried over from the preceding year, the undistributed receipts on Dec. 31, 1919, were \$352,911. Since Sept. 16, 1907, the total distributions have been \$26,625,000, about one-half of this amount being distributed in the first ten years and the remainder in the past three years.

In detailing the developments of the year the trustees refer to the lease of the Trumbull, North Star, Bingham, Hill and Boeing properties last year to the Cleveland-Cliffs Iron Co. The royalties range from \$1.10 down to 60 cents. Reference is made to the leasing by the subsidiary Polk and Jackson companies of one-half interest in ore lands in Itasca County to the Lorain Iron Mining Co., a subsidiary of the United States Steel Corporation, in exchange for which the Steel Corporation conveyed a half interest in the Hill mine. In the balance sheet of the trustees the mineral and non-mineral lands and leases are carried in the statement of assets at \$83,317,170.

The statement of shipments made in 1919 on behalf of the trustees shows a total of 3,613,922 gross tons, including 346,870 tons from stockpiles of the Arthur Iron Mining Co., which ceased mining on its own account in 1917.

The machinists returned to the shop of the Northern Nut, Bolt, Screw & Wire Co., Owen Sound, Ont., July 26, after being out on strike ten weeks. The basis of the agreement on which they returned is that a first-class mechanic shall receive an increase of 26 per cent over the previous wage scale. Men who are not first-class mechanics will also receive an increase, almost as large as the others. The offer on which the men returned is the same as that made by the company before the men went on strike.

Probable Increased Cost of Iron and Steel

PITTSBURGH, Aug. 3.—No very clear line yet is to be had on the probable increase in costs which is entailed in the new railroad freight rates which become effective probably on Sept. 1. Some of the independent steel companies figure that the new tariffs will mean increases in the cost of producing steel of \$2 to \$5 per ton, but such estimates are based upon the rather incomplete data that as yet are available. When the actual rates are made up, it may prove that such estimates, particularly of \$5 per ton, are too high, for attention is being drawn to the fact that the increases do not weigh heavily upon ore or coal. The freight rate on ore from the mines to the upper lake docks is not to be changed and coal freight rates are not given a straight percentage boost, but are to be increased in groups, though the increase may be sufficient to yield the same aggregate increase in revenue that would accrue to a flat percentage increase applicable to all fields.

Figuring on the 40 per cent increase granted the railroads in the Eastern group, it is calculated that Valley pig-iron producers are confronted with an increase in costs of about \$1.50 per ton, varying with the age and average producing costs of the different stacks. Good practice in a modern furnace making basic iron would entail the use of 1.8 tons of ore, about 1 ton of coke and about 1400 lb. of limestone. A 40 per cent increase on the present rates for these quantities would add 58 cents to the cost of the ore required, 72 cents in the cost of getting a ton of coke to the Valley furnaces and 24 cents to the charge for transporting the limestone. This makes a total of \$1.54 and applies only to basic iron, where costs are lowest. On Bessemer and foundry grades the costs would be higher because of the greater amount of fuel required in making these grades.

In view of the fact that most steel company blast furnaces are fairly modern and capable of low costs through good practice, it would seem as if \$1.50 amply would cover the increase in freight costs, with allowance for losses in the conversion of the iron into steel that an advance in the latter cost of \$5 per ton is somewhat larger than necessary to cover the increased rates.

It may be stated that some of the independent companies already are figuring the increased freight rates in their quotations, but the course of the United States Steel Corporation in the matter is not clear, although the impression is gained that it will continue to quote the March 21, 1919, prices and absorb the rise in the cost of production.

Unfilled Tonnage of Sheet Producers

YOUNGSTOWN, Aug. 3.—Independent sheet producers identified with the National Association of Sheet and Tin Plate Manufacturers are booked ahead for the rest of the year, it was stated at the monthly meeting in Youngstown to-day. Aggregate unfilled tonnage on books of affiliated makers is in excess of 800,000 tons, which compares with a monthly production capacity of 150,000 tons. Unshipped output is about 100,000 tons. Production is averaging 70 per cent. Walter W. Lower, of Pittsburgh, secretary-treasurer, was in charge of the convention in the absence of President W. S. Horner.

E. S. Hubbard, B. L. Baker and B. H. Mathis, formerly identified with the Allegheny Steel Tank Car Co., Warren, Pa., have organized under the laws of Pennsylvania the Warren Tank Car Co., Warren, Pa., which will engage in the building, repairing and selling of tank cars. The company is capitalized at \$100,000, all common stock, and has a plant situated at Starbrick Station, near Warren, on the New York Central and Pennsylvania railroads. The plant is electrically equipped and the machinery is of the most modern type. Officers of the new company are William Muir, president; George L. Craft, vice-president; W. C. Heasley, secretary, and B. H. Mathis, treasurer.

Readjustments in Progress in European Steel Trade

Belgium Planning for World Markets, France Waiting for Lower Prices, England Expediting Lorraine Ore Shipments and Germany Seeking American Capital

(By Correspondence)

BRUSSELS, BELGIUM, July 15.—The Belgian market continues to be affected by large amounts of material which appear from time to time at lower than prevailing quotations. Although there are numerous buyers in Brussels from England, South American points and the Orient, they are not inclined to purchase at present prices. Rather, they look upon Belgium as being in the class with Germany, a place to pick up low-priced material.

Attempt to Eliminate British Middlemen

This reputation that Belgium has recently acquired as a "cheap" country is inspiring producers to enter into competition for the world markets, to which England re-exports material purchased. With new shipping lines at Antwerp and branches of most of the British banking houses in Brussels, Belgian manufacturers see the possibility of eliminating England as the middleman and being able to sell at higher prices directly to the foreign consumer.

With this as their goal, manufacturers of locomotives and rolling stock particularly are exerting tremendous efforts to regain old markets, but shortage of labor and material is proving a great obstacle. On a recent inquiry from Chili for 70 locomotives and 700 cars, only one Belgian plant was able to submit bids. Much of the skilled labor has been absorbed at high wages by the automobile and motorcycle manufacturers and the repair shops.

The scarcity of agricultural machinery has increased the need for repair work on old machines and engines and has drawn numerous machinists and other skilled workers into the repair field. The dull state of domestic production has opened the field for German and American machines with some of English origin. The latter, however, are usually too expensive to sell widely.

Water Shipment of Lorraine Ore to England

The continued dwelling upon the drop in prices of all commodities by the French newspapers is undoubtedly having its effect, but with present under production of iron and steel of all kinds there seems little possibility of a serious collapse in the market. Engaged in the industry at present there are about 26,000 workers. Coal production of the Loire district in 1919 was 3,500,000 tons against a production of 5,000,000 tons in 1918. Frequent strikes have been called in this section. The average wage of the steel workers is \$3 per day against \$1 in 1914.

In order to relieve the acute shortage of ore in England, British consumers have arranged to place in service a number of transports between Lorraine and England, via Strasburg, Cologne and Rotterdam. German shipyards are anxious to compete for the contract to build these ships and have requested permission of the Allies to buy ship material in the United States.

German Desire for American Co-operation

In Germany there are numerous instances of American and British interests gaining control of manufacturing plants. Even Italian financiers are reaching out into Central Europe, recent instances being the re-financing by Italians of a large steel works at Ternitz and the acquisition of control by American interests for 25,000,000 marks of the works of the Allgemeine Elektrizitäts-Gesellschaft. The payment is to be used to purchase material, copper being the largest item.

Although German-owned and operated plants receive concessions from the government, there is agitation in the newspapers and among business men toward inducing more American capital to invest in Ger-

many. Phrases such as, "the Germans are the Americans of Europe" and "German-American co-operation is the only thing that can save Germany," continually appear. Efforts of foreign capital to gain control are not confined to Germany. A proposition to lease a large plant in Belgium for a minimum of three years has been made by foreign interests.

German Machine Tools to Holland

Machine tools are in active demand in Holland, much of this business being placed with German concerns because of the low exchange. In the Netherlands the rapid industrial expansion is opening a good market for machine tools, medium capacity engines and power units. German manufacturers have booked much of the increasing business partly on price and partly because of their willingness to fill orders for the diverse sizes that are used by the manufacturers of Holland. There are evidently many orders for better grade machine tools that have not been placed with Germany, but it is not through any lack of effort on the part of the German company to satisfy the customer to the minutest detail.

Since the armistice, Germany has searched foreign fields for a new source of ore supply and recently a decision was made to operate borings in Dutch Guiana. A five meter vein was discovered last April, estimated to contain about 12,000,000 tons. The possibility of locating other large ore deposits in the Dutch colonies has been considered at meetings of the board of directors of the Surinam Mining Co. and a German mission headed by a Dr. Durrer has been sent out to investigate. The Krupp interests is one of the first large German concerns to conclude agreements for a supply of ore other than from Lorraine and Luxemburg.

Phoenix Iron Works Co. to Expand

The Phoenix Iron Works Co., Meadville, Pa., has grown so rapidly during the past six years that the directors have decided to reorganize. There will be issued \$1,500,000 worth of preferred stock, \$1,000,000 of which has been underwritten by the R. L. Dollings Co., banker, Philadelphia. This will give the company sufficient capital to make some additional improvements and alterations to the plant, calculated to increase production materially and give employment to larger numbers. The Phoenix company is the oldest manufacturing concern in Meadville, having been established in 1865. It makes locomotive cylinders, gray iron castings for railroads and blast furnaces, machinery for steel works and sugar mills, refinery equipment and storage tanks. The company has eight field forces for erection work.

The property of the Titan Steel Corporation, Newark, N. J., the organization of which was noted on page 270 of the issue of July 29, includes land, buildings and equipment appraised by engineers at \$1,633,360.80, and in addition there is an inventory valued at present market prices at \$250,000.

The Laclede Steel Co., St. Louis, is constructing a new mill at its Madison, Ill., plant for the manufacture of cold rolled steel. It is anticipated that it will be ready for operation by Oct. 1.

The Oliver Iron & Steel Co., Pittsburgh, has placed the contract for a concrete building at Muriel and South Tenth streets to cost \$32,000.

The Donner Steel Co., Buffalo, N. Y., put in operation on Aug. 2 its 8-in. bar mill.

Non-Ferrous Metals

The Week's Prices

Cents Per Pound for Early Delivery

	Copper		Lead		Zinc		
	New York	Lake Electro- lytic	Tin	New York	New St. Louis	New York	St. Louis
July							
28	19.00	19.00	48.75	9.00	8.75	8.15	7.80
29	19.00	19.00	48.25	9.00	8.75	8.15	7.80
30	19.00	19.00	48.25	9.00	8.75	8.05	7.70
31	19.00	19.00	....	9.00	8.75	8.05	7.70
August—							
2	19.00	19.00	48.00	9.00	8.75	8.05	7.70
3	19.00	19.00	48.50	9.00	8.75	8.05	7.70

The markets are all quiet. Prices in some are firm and in others weak. The prevailing opinion is that the advance in freight rates will be passed on to the consumer and that prices of copper, lead and zinc will be increased when the high rates are effective.

New York

Copper.—The market is very quiet, but prices are very firm. Large producing interests of both Lake and electrolytic copper maintain their quotations at 19c., New York, for delivery in August and September. While domestic business is light, a fair volume of foreign orders is being booked constantly. In the speculative or outside market there is very little business reported with quotations around 18.75c., New York. The freight advances are expected to raise the price of copper as well as the cost. In view of this and other conditions sellers are not pressing forward delivery and are expecting higher prices in the fall.

Copper Averages.—The average price of both Lake and electrolytic copper for the month of July, based on daily quotations in THE IRON AGE, was 19c.

Lead.—The good demand of the last few weeks has disappeared, and offerings of the small available supplies have not been absorbed. Some business has been done at 9c., St. Louis, for fairly prompt shipment. Lead in transit and for spot delivery has also sold at 9c., New York. It is rumored that a large quantity of import lead is afloat from England. If this is true, the arrival of this, coupled with the foregoing conditions, will cause the New York market to decline so that it might fall to a level below St. Louis. Quotations in the outside market are largely nominal at 8.75c., St. Louis, or 9c., New York, with that of the leading interest unchanged at 8.25c., St. Louis, or 8.50c., New York.

Zinc.—Demand is very light and confined to prompt and early delivery. Producers are taking care of this demand, but are unwilling sellers for future delivery, stating that there is no profit at present levels. They are also waiting for the effect of the advance in freight rates on ore prices as well as the metal. Prime Western for August-September delivery is quoted at 7.70c., St. Louis, or 8.05c., New York.

Antimony.—Wholesale lots for early delivery are quoted at 7.25c., New York, duty paid.

Aluminum.—Virgin metal, 98 to 99 per cent pure, in wholesale lots for early delivery, is quoted at 33c. per lb., New York, by the leading interest and at 31.50c. by other sellers.

Tin.—The market is dull almost to stagnation, and the amount of business has been only about enough to establish prices. Consumers are still uninterested. A feature is the extremely light offerings of the metal, which would indicate that it would not take much to put up prices. Speculators even are allowing the market to drift. For the first week in some time there were no sales on the New York Metal Exchange and yesterday, being a holiday in London, the market here stood still. To-day spot Straits tin is quoted here at 48.50c., New York, and in London at £288 per ton with spot standard tin at £273 and future standard at £278. The monthly

tin statistics reveal some interesting facts. With deliveries into consumption of 5530 tons and total arrivals of 3870 tons, 1660 tons more than arrived were delivered to consumers, which would indicate splendid business and a heavy inroad into stocks unless much of this disappeared as invisible stocks. The imports to Aug. 1 have been 31,613 tons against only 6341 tons to Aug. 1, 1919. Of this year's imports 22,805 tons came from the Straits.

Old Metal.—Red and yellow metals have been very quiet, the only active item being lead. Dealers' selling prices are nominally as follows:

	Cents Per Lb.
Copper, heavy and crucible.....	18.50
Copper, heavy and wire.....	17.25
Copper, light and bottoms.....	14.75
Brass, heavy	13.00
Brass, light	9.00
Heavy machine composition.....	17.50
No. 1 yellow rod brass turnings.....	10.50
No. 1 red brass or composition turnings.....	14.75
Lead, heavy	8.00
Lead, tea	6.00
Zinc	6.00

Chicago

AUG. 3.—There has been little inquiry for copper and prices are unchanged. Tin has been dull and while there has been no particular pressure to sell, prices have fallen 1 cent. Although the demand for lead has not been heavy, offerings are limited and prices are firmer. Spelter is quiet and shows a tendency toward weakness, although sellers are making no effort to dispose of their stocks. Antimony is dull. Old metals are unchanged. We quote Lake copper at 19c. to 19.25c. in carload lots; tin, 52c. to 53c.; lead, 9c. to 9.25c.; spelter, 7.90c.; antimony, 9c. to 10c. On old metal we quote copper wires, crucible shapes, 13.50c.; copper clips, 13.50c.; copper bottoms, 11.50c.; red brass, 13.50c.; yellow brass, 9c.; lead pipe, 6.25c.; zinc, 4c.; pewter, No. 1, 25c.; tin foil, 30c.; block tin, 35c., all these being buying prices for less than carload lots.

St. Louis

Aug. 2.—The non-ferrous markets have been weaker during the past few days, closing, in car lots, as follows: Lead, 8.85c. to 9c.; spelter, 7.75c. to 7.85c. In less than car lots the quotations are: Lead, 9.50c.; spelter, 8.50c.; tin, 55c.; copper, 19c.; antimony, 9.50c. Stocks are plentiful and moving rather slowly. In the Joplin district there has been very little change in the ore situation and prices for zinc blend, calamine and lead show no material difference from the last figures. On miscellaneous scrap metals we quote dealers' buying prices as follows: Light brass, 8c.; heavy red brass, 14c.; light copper, 12c.; heavy yellow brass, 12c.; heavy copper and copper wire, 14c.; zinc, 4.50c.; lead, 5.50c.; pewter, 25c.; tinfoil, 38c.; tea lead, 3c.; aluminum, 20c.

No Decrease in Building Expected

In a recently prepared monograph, H. H. Fox, vice-president Turner Construction Co., New York, avers that the shortage in buildings to-day is so great that it cannot be corrected for many years, and for this reason it is not probable that there will be any material decrease in building. Although the prospective builder must be prepared for some delay in the completion of work ordered in the immediate future, Mr. Fox also points out, he can undertake construction work, nevertheless, without fear either that there will be a sharp drop in building costs after his work is completed or that there will be a material falling off in the demand for his products in case he has something to make or sell. The causes for the falling off in the demand for new buildings that occurred around May 1 and for some cancellations and stoppage of work on buildings already under construction were listed by Mr. Fox as follows: (1) High estimates of the cost of new buildings; (2) uncertainty in the minds of owners; (3) high money rates; and (4) politics.

Prices Finished Iron and Steel, f.o.b. Pittsburgh

Freight rates from Pittsburgh on finished iron and steel products, in carload lots, to points named, per 100 lb., are as follows:

New York, 27c.; Philadelphia, 25c.; Boston, 29½c.; Buffalo, 21c.; Cleveland, 17c.; Cincinnati, 23½c.; Indianapolis, 24½c.; Chicago, 27c.; St. Louis, 34c.; Kansas City, 59c.; St. Paul, 49½c.; all in carloads, minimum 36,000 lb. To Denver the rate is 99c., minimum carload 40,000 lb.; Omaha, 59c., minimum carload 36,000 lb.; New Orleans, 38½c., minimum carload 36,000 lb.; Birmingham, 57½c., minimum carload 36,000 lb. To the Pacific Coast the rate is \$1.25 per 100 lb. on articles of iron and steel, minimum carloads 80,000 lb., while the structural steel rate is \$1.25, minimum carload 50,000 lb., or \$1.315, minimum carload 40,000 lb. The rate on ship plates, Pittsburgh to Pacific Coast, is \$1 per 100 lb., minimum carload 80,000 lb. On wrought iron and steel pipe, the rate from Pittsburgh to Kansas City is 56c.; to St. Paul 49½c.; to Denver, 99c.; to Omaha, 56c., all in carload lots, minimum 46,000 lb. To Jacksonville, Fla., all rail carloads, 41½c., minimum 36,000 lb., less than carloads, 59c.; rail and water, carloads 34½c., minimum 36,000 lb.; less than carloads 46½c. On iron and steel items not noted above, the rates vary somewhat, and are given in detail in the regular railroad tariffs.

Structural Material

I-beams, 3 to 15 in.; channels, 3 to 15 in., angles, 3 to 6 in., on one or both legs, ¼ in. thick and over, and zees, structural sizes, 2.45c. to 3.25c.

Wire Products

Wire nails, \$3.25 to \$4.50 base per keg; galvanized, 1 in. and longer, including large-head barbed roofing nails, taking an advance over this price of \$1.50 and shorter than 1 in., \$2. Bright basic wire, \$3 to \$4 per 100 lb.; annealed fence wire, Nos. 6 to 9, \$3 to \$4.25; galvanized wire, \$3.70 to \$4.70; galvanized barbed wire and fence staples, \$4.10 to \$5.10; painted barbed wire, \$3.40 to \$4.45; polished fence staples, \$3.40 to \$4.50; cement-coated nails, per count keg, \$2.85 to \$4.10; these prices being subject to the usual advances for the smaller trade, all f.o.b. Pittsburgh, freight added to point of delivery, terms 60 days net, less 2 per cent off for cash in 10 days. Discounts of the American Steel & Wire Co. on woven-wire fencing are 60 per cent off list for carload lots, 59 per cent for 1000-rod lots, and 58 per cent for small lots, f.o.b. Pittsburgh.

Bolts, Nuts and Rivets

Large structural and ship rivets.....\$4.50 base
Large boiler rivets.....4.60 base
Small rivets.....45 per cent off list
Small machine bolts, rolled threads 40 and 50 per cent off list
Same sizes in cut threads.....30 and 10 per cent off list
Longer and larger sizes of machine bolts..30 per cent off list
Carriage bolts, ¾ in. x 6 in.:
Smaller and shorter, rolled threads, 30 and 10 per cent off list
Cut threads.....30 per cent off list
Longer and larger sizes.....25 per cent off list
Lap bolts.....45 per cent off list
Flow bolts, Nos. 1, 2 and 3 head.....35 per cent off list
Other style heads.....20 per cent extra
Machine bolts, c.p.c. and t. nuts ¾ in. x 4 in.:
Smaller and shorter.....30 per cent off list
Longer and larger sizes.....20 per cent off list
Hot pressed and cold pressed sq. or hex. blank nuts.....\$1.50 off list
Tapped nuts.....\$1.00 off list
Semi-finished hex. nuts, U. S. S. and S. A. E.:
5/8-in. and larger.....50 and 10 per cent off list
3/16-in. and smaller.....50 and 10 per cent off list
9/16-in. and smaller, A. L. A. M. or S. A. E.,
60 and 5 per cent off list
Stove bolts in packages.....60 and 10 per cent off list
Stove bolts in bulk.....60, 10 and 2½ per cent off list
Tire bolts.....50 per cent off list
Track bolts.....7c. base
One cent per lb. extra for less than 200 kegs. Rivets in 100-lb. kegs 25c. extra.
All prices carry standard extras f.o.b. Pittsburgh.

Wire Rods

No. 5 common basic or Bessemer rods to domestic consumers, \$52 to \$80; chain rods, \$75 to \$80; screw stock rods, \$80 to \$85; rivet and bolt rods and other rods of that character, \$75 to \$80; high carbon rods, \$85 to \$100, depending on carbons.

Railroad Spikes and Track Bolts

Railroad spikes, 9/16-in. and larger, \$4 per 100 lb. in lots of 200 kegs of 200 lb. each or more; spikes, ½-in., ¾-in., and 7/16-in., \$4.25 to \$4.50; 5/16-in., \$5 to \$5.25; track bolts, 57c. boat and barge spikes, \$4.50 per 100 lb. in carload lots of 200 kegs or more, f.o.b. Pittsburgh. Tie plates, \$3 to \$4 per 100 lb.

Terne Plates

Prices of terne plates are as follows: 8-lb. coating, 200 lb., \$13.80 per package; 8-lb. coating, I. C., \$14.10; 12-lb. coating, I. C., \$15.80; 15-lb. coating, I. C., \$16.80; 20-lb. coating, I. C., \$18.05; 25-lb. coating, I. C., \$19.30; 30-lb. coating, I. C., \$20.30; 35-lb. coating, I. C., \$21.30; 40-lb. coating, I. C., \$22.30 per package, all f.o.b. Pittsburgh, freight added to point of delivery.

Iron and Steel Bars

Steel bars at 2.35c. to 4c. from mill. Common bar iron, 4.75c.

Wrought Pipe

The following discounts are to jobbers for carload lots on the Pittsburgh basing card:

Butt Weld

Steel	Inches		Inches	Iron	
	Black	Galv.		Black	Galv.
1½, 1¾ and 2½	47 to 50½	34½ to 38	1½	15½ to 25½	+1½ to 11½
½ to 6	50 to 53½	37½ to 41	2½ to 6	22½ to 30½	9½ to 17½
7 to 12	47 to 50½	33½ to 37	7 to 12	19½ to 27½	6½ to 14½
13 and 14	37½ to 41		¾ to 1½	24½ to 34½	8 to 18½
15	35 to 38½				

Lap Weld

2	47 to 50½	34½ to 38	2	20½ to 28½	6½ to 14½
2½ to 6	50 to 53½	37½ to 41	2½ to 6	22½ to 30½	9½ to 17½
7 to 12	47 to 50½	33½ to 37	7 to 12	19½ to 27½	6½ to 14½
13 and 14	37½ to 41		¾ to 1½	24½ to 34½	8 to 18½
15	35 to 38½				

Butt Weld, extra strong, plain ends

1½, 1¾ and 2½	43 to 46½	25½ to 29	1½	+17	+50
½ to 6	48 to 51½	35½ to 39	½ to 6	13½ to 23½	6½ to +3½
7 to 12	52 to 55½	39½ to 43	7 to 12	18½ to 28½	5½ to 15½
13 to 14	53 to 56½	40½ to 44	¾ to 1½	24½ to 34½	9½ to 19½
15	53 to 58½				

Lap Weld, extra strong, plain ends

2	45 to 48½	33½ to 37	2	21½ to 29½	8½ to 16½
2½ to 4	48 to 51½	36½ to 40	2½ to 4	23½ to 31½	11½ to 19½
4½ to 6	47 to 50½	33½ to 39	4½ to 6	23½ to 30½	10½ to 18½
7 to 8	43 to 46½	29½ to 33	7 to 8	14½ to 22½	2½ to 10½
9 to 12	38 to 41½	24½ to 28	9 to 12	9½ to 17½	5½ to +3½

To the large Jobbing trade an additional 5 per cent is allowed over the above discounts, which are subject to the usual variations in weight of 5 per cent.

On butt and lap weld sizes of black iron pipe, discounts for less than carload lots to jobbers have been seven (7) points lower (higher price) than carload lots and on butt and lap weld galvanized iron pipes have been nine (9) points lower (higher price).

Boiler Tubes

The following are the prices for carload lots f.o.b. Pittsburgh:

Lap Welded Steel

3½ to 4½ in.	20½ to 40½	1½ and 1¾ in.	+20
2½ to 3½ in.	10½ to 30½	2 and 2½ in.	+10
2½ in.	4 to 24	2½ and 2¾ in.	+1
1¾ to 2 in.	+½ to -1½	3 and 3¾ in.	-1½

Charcoal Iron

1½ and 1¾ in.	+20
2 and 2½ in.	+10
2½ and 2¾ in.	+1
3 and 3¾ in.	-1½

Standard Commercial Seamless—Cold Drawn or Hot Rolled

Per Net Ton	Per Net Ton
\$327	\$207
267	177
287	167
207	187
4½ to 5 in.	207

These prices do not apply to special specifications for locomotive tubes nor to special specifications for tubes for the Navy Department which will be subject to special negotiations.

Sheets

Prices of the Steel Corporation for mill shipments on sheets of United States standard gage in carloads and larger lots for indefinite delivery are given in the left-hand column. For reasonably prompt delivery, mills are getting up to the prices quoted in the right-hand column:

Blue Annealed—Bessemer

Cents per lb.
3.50 to 6.95
3.55 to 7.00
3.60 to 7.05
3.65 to 7.10
3.75 to 7.20

Box Annealed, One Pass Cold Rolled—Bessemer

Nos. 17 to 21	4.15 to 7.80
Nos. 22 to 24	4.20 to 7.85
Nos. 25 and 26	4.25 to 7.90
No. 27	4.30 to 7.95
No. 28 (base)	4.35 to 8.00
No. 29	4.45 to 8.10
No. 30	4.55 to 8.20

Galvanized Black Sheet Gage—Bessemer

Nos. 10 and 11	4.70 to 8.00
Nos. 12 to 14	4.80 to 8.10
Nos. 15 and 16	4.95 to 8.25
Nos. 17 to 21	5.10 to 8.40
Nos. 22 to 24	5.25 to 8.55
Nos. 25 and 26	5.40 to 8.70
No. 27	5.55 to 8.85
No. 28 (base)	5.70 to 9.00
No. 29	5.95 to 9.25
No. 30	6.20 to 9.50

Tin-Mill Black Plate—Bessemer

Nos. 15 and 16	4.15 to 6.15
Nos. 17 to 21	4.20 to 6.20
Nos. 22 to 24	4.25 to 6.25
Nos. 25 to 27	4.30 to 6.30
No. 28 (base)	4.35 to 6.35
No. 29	4.40 to 6.40
No. 30	4.40 to 6.40
Nos. 30½ and 31	4.45 to 6.45

PERSONAL

JOHN DUNCAN, who was elected president of the Wheeling Steel & Iron Co., Wheeling, W. Va., at a meeting of the company held in that city July 28, to succeed Isaac M. Scott, who on July 3 was elected president of the recently organized Wheeling Steel Corporation, takes into his new position an experience of more than 30 years in the steel business. His first connection with the industry was in the capacity of bill clerk for the National Tube Co. in St. Louis in 1889. Later he became identified with the Haxtun Steam Heater Co., Kewanee, Ill., the name of which subsequently was changed to the Western Tube Co. In 1903, he was made vice-president and general manager of sales of that company and when it was absorbed by the National Tube Co. in 1908, he was transferred to Pittsburgh, becoming assistant general manager of sales of the latter company. Late in 1909, he joined the Wheeling Steel & Iron Co. as general manager of sales and in 1914, when the company was consolidated with another Wheeling company, he was elected vice-president and retained in the office of general manager of sales of the consolidated company.

C. K. Southard, formerly assistant to F. M. Bowman, vice-president Blaw-Knox Co., Pittsburgh, has been promoted to the position of chief engineer of the C. D. Pruden Corporation, Baltimore, a subsidiary of the Blaw-Knox Co.

Dr. William H. Tolman, who was active in the formation of the American Museum of Safety, New York, and for several years was its secretary, has been appointed attache in social economy to the ministry of social welfare at Prague, Czechoslovakia.

Max G. Niman, president National Foundry Co. of New York, Inc., maker of plumbing specialties, 10 Sanford Street, Brooklyn, has returned from a five weeks trip to Alaska for business and pleasure. He inspected some of the foundries there, most of which are for remelting scrap and recasting for mining purposes.

William C. Briggs, sales engineer and New York manager Shepard Electric Crane & Hoist Co., has become vice-president in charge of manufacturing of the Franklin Moore Co., Winsted, Conn., maker of electric hoists, small electric cranes and spur geared chain block.

Evans Jones, superintendent sheet and jobbing mills of the Bethlehem Steel Co. at Sparrows Point, Md., has resigned to become manager of the Harrisburg plant of Lalance & Grosjean Mfg. Co.

Harold B. Buse, formerly with the Geometric Tool Co., New Haven, Conn., has become sales engineer with Hill, Clarke & Co., Boston, as Connecticut representative.

Dr. Alphonse A. Adler, professor of machine and power plant design Polytechnic Institute of Brooklyn, has resigned to devote his time to his practice as consulting engineer in power and industrial plant engineering in New York.

Charles G. Barrett, formerly sales engineer, marine department, Fairbanks, Morse & Co., New York, has become associated with the Worthington Pump & Machinery Corporation, Blake & Knowles Works, East Cambridge, Mass.

The Sizer Forge Co., Buffalo, N. Y., has recently appointed Edward L. Soule & Co., San Francisco, and

W. J. Prichard, Portland, Ore., as its sales agents for the Pacific Coast, the former to handle sales in California and Mr. Prichard Oregon and Washington.

A. Van Winkle was elected secretary of the Consolidated Steel Corporation, New York, at a meeting of the directors held on July 28, and C. L. Hayes was made comptroller and assistant secretary.

Fred C. Moses, formerly designing engineer Bethlehem Steel Co., Bethlehem, Pa., has become assistant mechanical engineer with the Aluminum Co. of America, Pittsburgh.

J. E. Cook has been made assistant to the general superintendent, C. A. Pennock, of the Eastern Rolling Mill Co., Baltimore. Mr. Cook was formerly superintendent of the finishing department at the same plant.

Robert R. Neild has become associated with the Nova Scotia Steel & Coal Co., New Glasgow, N. S., and with the John Inglis Co., Ltd., Toronto. He was formerly with the Victoria Machinery Depot Co., Ltd., and the Coughlan Shipyards.

Frank M. Welsh, formerly associated with the steel export firm of Knapp & Baxter, 30 Church Street, New York, the business of which recently was sold to the International Steel Corporation, has joined the Iron Trade Products Co., Pittsburgh, as New York district sales manager. His territory, in addition to New York City, will include Bridgeport, Conn., Albany and Schenectady, N. Y., and extend to Trenton, N. J. Mr. Welsh for a number of years was attached to the Pittsburgh sales office of the Republic Iron & Steel Co., and before identifying himself with Knapp & Baxter was New York district sales manager for Hickman, Williams & Co., Inc.

Edward S. Keen, manager Export Service Department, Iron Age Catalog of American Exports, having completed the work for which he was employed, has tendered his resignation and leaves the services of the Iron Age Publishing Co. with its best wishes. Mr. Keen made a trade survey of the world in order to compile 10,000 names of leading agents, merchants, manufacturers, railroads, light, heat and power plants, municipal and governmental bodies, upon which was based the distribution of the Iron Age catalog. He has had long experience in making surveys for industrial plants and in serving as purchasing agent and traffic manager of industrial concerns.

Frederick M. Davenport, professor of law and polity in Hamilton College, Clinton, N. Y., and New York state senator, is working on a lathe at the plant of the H. H. Franklin Mfg. Co., Syracuse, N. Y., in order that he may better get the viewpoints of the workmen and learn industrial relations at first hand. He will also spend some time in the tool room and in the final inspection department. He believes that his experience will assist him in matters of legislation pertaining to the welfare of manual workers.

President J. O. Eaton, of the Standard Parts Co., Cleveland, announces the promotion of Charles L. Ochs to general manager of the Eaton Axle Co. Mr. Ochs has been assistant general manager since the Eaton Axle organization was placed in charge of the axle division of the Standard Parts Co. His new position places him in charge of the three large units now included in this division: the new Eaton factory, the West Eighty-third Street (Cleveland), plant, and the Cincinnati establishment.

John Bath, president John Bath & Co., Inc., Worcester, Mass., machine tools, etc., has been made a member of the sectional committee, American engineering standards committee, recently organized to undertake the standardization of plain cylindrical gages for general engineering work, under the sponsorship of the American Society of Mechanical Engineers.

W. A. Erickson, who was recently transferred from the Worcester, Mass., office of the Heald Machine Co. to the New York office, has again been transferred to the Buffalo office, where he will be sales manager for the western New York territory, effective Aug. 1.

John M. Biles, general manager, and Torsten A. Gyllsdorff, superintendent, announce their resignation



JOHN DUNCAN

from the Detroit Reamer & Tool Co., and the incorporation of the Standard Reamer & Tool Co., 410-424 Elmwood Avenue, Detroit. The new company will manufacture a complete line of standard reamers, cutters and special tools. Officers are: Arthur J. Stock, president; Frank J. Trippensee, vice-president; Torsten A. Gylsdorff, secretary and superintendent; John M. Biles, treasurer and general manager.

R. T. Hazelton, for several years superintendent and chief engineer Cincinnati Milling Machine Co., has been appointed works manager of the Cincinnati Shaper Co., Cincinnati. He undertook his new duties July 1, coincident with the throwing into operation of the large addition to the plant of the company, just completed. He will also have charge of production for the Cincinnati Gear Cutting Machine Co., a subsidiary of the Cincinnati Shaper Co. Following the expansion of these companies, and the additional floor space now available, it is anticipated that the output of the two companies will be doubled soon.

Frederick A. Jones, formerly vice-president and general manager Eastern Steamship Co., Boston and Portland, Me., is general manager, Hobbs Mfg. Co., Worcester, Mass., box cutters, etc., to succeed Arlington Moore, resigned.

J. Van Ackeren, operating superintendent Koppers Co., Pittsburgh, arrived in New York, July 28, on the steamer Noordam, from Rotterdam, after a visit of several months in Europe. H. Lee, contracting engineer Koppers Co., sails from Liverpool Aug. 7, after several weeks' inspection of European by-product coke plants.

John K. Frye has been appointed a member of the sales organization of Fairbank & Co., iron and steel jobbers, Wade Building, Cleveland, to commence Aug. 1. He has been connected with the iron and steel industry for many years. For the last five years Mr. Frye was general purchasing agent of the Donner Steel Co., Buffalo, and prior to that was connected with Banning, Cooper & Co., Ltd., Pittsburgh.

A. J. Lewis, formerly assistant sales manager Superba Coal & Coke Co., Pittsburgh, recently assumed his new duties as manager of the coke department of the West Penn Fuel Co., Inc., Commonwealth Building, Pittsburgh.

James H. Remington, chief purchasing agent Waukesha Motor Co., Waukesha, Wis., has tendered his resignation, to take effect Sept. 15. He was associated with the company 15 years.

Edward Walton, director of personnel at the Cincinnati Ball Crank Co., has been elected president of the Cincinnati Employment Managers' Association, succeeding George Halsey, who resigned recently because of stress of other business.

Leo H. Marks, formerly with Fishel & Marks Co., Cleveland, has opened a steel warehouse under the name of Leo H. Marks Steel Supply Co., 10802 Quebec Avenue, Cleveland, on the Belt Line Railroad. The company will handle warehouse and mill shipments of various steel products.

Samuel M. Hershey, Philadelphia district sales manager Heald Machine Co., Worcester, Mass., has resigned, effective Aug. 1, to become sales manager for the newly organized A. B. Landis & Sons, Philadelphia, specialists in external, internal, surface and crank grinding. The company also manufactures parts complete that require hardening and grinding. He has been connected with the grinding business since 1903, having had charge of operating and selling. His experience has been with the Landis Tool Co., the Hyatt Roller Bearing Co., the Norton Co. and the Heald Machine Co. A. R. Sleath, who has represented the Heald company in the southern territory, will succeed him in the Philadelphia office.

Louis A. Delaney, formerly with the F. X. Hooper Co., Inc., Glenarm, Md., has joined the American Sheet Metal Corporation of Philadelphia as manager.

S. C. Horn, 311 Commercial Tribune Building, Cincinnati, has been appointed representative for the Cin-

cinnati district by Wilson-Maeulen Co., maker of indicating and recording electric pyrometers.

William P. Stout has been appointed district sales manager of the Philadelphia office of the Columbia Steel & Shafting Co., Pittsburgh. The Pittsburgh district will be in charge of Mr. Seaman.

J. Corcoran, formerly with the Cleveland Hydraulic Pressed Steel Co., has been appointed general superintendent of the Sharon Pressed Steel Co. at Wheatland, Pa.

Department heads at the Sharon, Pa., plant of the American Sheet & Tin Plate Co. presented D. T. Hadcock with a diamond scarf pin when he resigned as superintendent.

P. L. Emerson, for the last three years general sales manager of the Olds Motor Works, Lansing, Mich., has purchased an interest in the Jackson Motors Corporation, Jackson, Mich., and has been elected president and general manager.

J. K. Murray has been appointed district sales manager for Michigan of C. E. Johansson, Inc., Poughkeepsie, N. Y., manufacturer of the Johansson gages. He was assistant sales manager of the concern in New York City.

F. N. Hoffstot, president Pressed Steel Car Co., has returned to the United States after ten months' absence on a trip around the world.

C. B. Durham, works manager of the Buick Motor Car Co., Flint, Mich., has been made assistant to the general manager of the company's Chicago properties.

William Grant, formerly foundry superintendent of the Rock Island Mfg. Co., Rock Island, Ill., has been made works manager of the Lansing Foundry Co., Lansing, Mich.

OBITUARY

CHARLES H. GOCKELER, who died after a protracted illness on July 19 on his forty-sixth birthday, entered the iron and steel business with Louis Hartig, in Washgton, and then was employed by the J. B. Kendall Co. of that city as city salesman. About fifteen years ago he entered the firm of D. K. Bramble, Inc., in New York, and later became the representative in New York territory of the Hoopes & Townsend Co., Philadelphia. Subsequently he established himself, as noted in last week's issue, at 30 Church Street, New York, as representative of manufacturers. He is survived by his wife, two sons, a mother, sister and brother. His brother, Chris J. Gockeler, is the Washington manager for Louis Hartig Iron & Steel Co. and vice-president of the District National Bank, Washington.

JAMES EASSON, who had been identified with the steel industry for about 17 years, died at his home, 617 Bellefonte Street, Pittsburgh, July 30. He was born in Dunblane, Scotland, Oct. 12, 1878, coming to this country when 10 years old. Soon after his graduation from Dartmouth College in 1902 he came to Pittsburgh to learn the steel business. He became assistant general superintendent of the Donora, Pa., works of the American Steel & Wire Co., and later superintended the building of the plant of the Standard Seamless Tube Co., Ambridge, Pa. Still later he became manager of the Baldt works of the Penn Seaboard Steel Corporation, Wilmington, Del. He had been in ill health for more than a year.

CORNELIUS E. ROGERS, in the Boston brass foundry business for the past 30 years, died recently at his home in Dorchester, aged 57 years. Among other organizations he was identified with the New England Foundrymen's Association.

EDWARD KENT, assistant treasurer Halcomb Steel Co., Syracuse, N. Y., died July 24 at his home in that city following an attack of pneumonia. He was 73 years old. He was born in Hastings, England, in 1847, and went to Syracuse at the age of 14. For a few years he worked for the Syracuse Chilled Plow Co. He joined the Halcomb company 20 years ago.

Machinery Markets and News of the Works

DULLNESS CONTINUES

Predictions of Activity in September

Tight Money, Cancellations and Price Raises Still the Unhealthy Factors

In spite of the quite general report that July was the worst month this year from standpoint of volume of sales, there was a fair-sized number of inquiries and a few sales of note last week. Optimism prevails as to conditions in the fall when the crops will have been moved and more money will be available for industrial purposes. Some already sense a picking up of business, reporting July better than June and the last week of July better than previous weeks.

Several railroads have been inquiring. The Chicago & Northwestern is asking for a few tools; also the New York Central, the Erie and the Chicago, Burlington & Quincy. It is again rumored that the Erie will soon come out with a list, approximately \$500,000. The Illinois Central is expected to enter for considerable equipment.

The holding up of orders, or their cancellation, still

continues. Two large companies in the New York district recently canceled on considerable equipment. Akron tire manufacturers have canceled or ordered machines held. Many of the inquiries at this time are doubtless for estimating purposes only. A Worcester, Mass., maker of grinding machines has advanced prices 12½ per cent, effective Aug. 1.

Out-of-store shipments in Chicago are still hampered by the teamsters' strike, but this will soon be coped with through the organization of the Machinery Dealers' Association of Chicago. Very low prices were secured by the Toledo District Salvage Board last week, lathes in good condition, for which the maker would ask over \$2600, selling as low as \$225.

Among recent purchases are those of the Ajax Forge Co., Chicago, of \$40,000 worth; the Wall Pump & Compressor Co., Quincy, Ill., of \$25,000 worth; the Willys-Overland Co. of several tool room lathes, as reported from Cleveland.

The Manomet Mills, New Bedford, Mass., cotton knitting yarns, expects to close on 16 repair shop tools soon; a southern New England boat building concern expects to close soon on a fairly good list of floating machine shop equipment.

New York

NEW YORK, Aug. 3.

Cancellations amounting to a considerable amount are before the trade from both the Empire Cream Separator Co., Bloomfield, N. J., and the Simms Magneto Co., East Orange, N. J., the latter being affected by the slump in practically all branches of the automobile industry. These cancellations are not considered serious, as most machine tool builders are booking but little new business and this will enable them to catch up with orders and again be able to promise more prompt deliveries.

Though the rumor to the effect that the Erie Railroad will soon inquire for a large list is not new, it is now even more likely that it will come out with a list for \$500,000 worth of tools. It has a recent inquiry for four tools for immediate purchase, including a boring mill and lathe. The New York Central Railroad has current inquiries for a few tools, consisting of a 16-in., 18-in. and 26-in. lathe and a saw for cutting axles.

The General Electric Co. has an inquiry out for 13 tools for its Bridgeport plant and two tools for its Pittsfield, Mass., plant.

A manufacturer of grinding machines in Worcester, Mass., has advanced prices 12½ per cent, effective Aug. 1. Reports are mixed as to the volume of sales in July as compared with other months this year. The majority agrees that July was the worst month; a few claim that it was better than June. One New York representative claims that last week was the best of any week during the past three months.

The railroad situation, the tight money market, and the shortage of small alternating current motors are all contributing to the unusual slackness now prevailing in the crane market. The shortage of motors, which has been acute for some time, shows no signs of relief. Solely because of inability to obtain electric equipment from the manufacturers there are numerous instances of enforced delay in shipping cranes, some of these delays extending from three to four months beyond the specified date of shipment. Export inquiries continue to appear, but foreign buyers are slow to place orders. Among recent inquiries is one from the Foundation Co., New York, for a 5-ton, 35-ft. span hand-power crane for South America. The Yukon Gold Co., 120 Broadway, New York, will shortly close for the 8-ton hand-power crane for the Malay States. The Coopra Co., which recently inquired for overhead traveling cranes for Rotterdam, Holland, owing to difficulties in obtaining early shipment because of the motor shortage, has

asked for bids on the cranes without electrical equipment, which will be purchased abroad. The United Electric Light & Power Co. has purchased the 110-ton and 75-ton overhead traveling cranes for which they were in the market. The South Porto Rico Sugar Co., New York, has also placed its order.

Among recent sales are: The Shepard Electric Crane & Hoist Co., a 2-ton, four-motor grab bucket crane to the Jaxon Steel Products Co., Jackson, Mich.; a 5-ton, 24-ft. span overhead traveling crane to the Palmer Foundry & Machine Co., Palmer, Mass., and a 5-ton, 24-ft. span overhead traveling crane to the Hempfield Foundries Co., Greensburg, Pa.; Niles-Bement-Pond Co., a 10-ton, 35-ft. span overhead traveling crane to the Baker Mfg. Co., Saratoga, N. Y.

The Ingersoll-Rand Co., 11 Broadway, New York, has awarded contract for the structural steel work to the American Bridge Co., 30 Church Street, and let other contracts for the erection of a new foundry and pattern shop at Painted Post, N. Y., 142 x 600 ft., and 50 x 150 ft. respectively.

The Gaillard Automobile Control Corporation, New York, has been incorporated with a capital of \$1,000,000 by R. Finia, J. H. O'Connell and M. Gaillard, Hotel Seville, to manufacture controlling devices for motor car service.

The Pierrot Mfg. Corporation, Albany, N. Y., has been incorporated with a capital of \$250,000 by H. A. Willis, A. Pierrot and J. Tarantino, Albany, to manufacture machinery for road building.

The Ideal Heat & Draft Regulator Co., 419 East Twenty-second Street, New York, manufacturer of heating equipment, has filed notice of dissolution under its New York charter.

Considerable mechanical and electrical equipment will be installed in the new plant of Stein-Hall & Co., Inc., 61 Broadway, New York, manufacturer of chemicals, at Sixth and Jackson avenues, Long Island City. It will be four-stories, reinforced concrete, and is estimated to cost about \$400,000. The Turner Construction Co., 244 Madison Avenue, has the contract.

The Northport Shipbuilding Corporation, Northport, L. I., has filed notice of dissolution, to be superseded by the Northport Shipyards, Inc., organized with a capital of \$100,000. H. E. Bogdish, M. D. Flomenhaft and G. N. Dorney, 244 West 134th Street, are the incorporators.

The Curtiss Aeroplane & Motor Co., Churchill Street, Buffalo, has acquired the Hazlehurst Aviation Field, near

Mineola, L. I., which includes about 135 acres, hangars, repair shops, etc. The new owner will use the property for aeroplane manufacture, including motors, parts, etc., as well as for experimental work. It is said that different features of work now handled at the Buffalo plant will be concentrated at this point. The site will be known as the Curtiss Field.

The Island City Electric Co., Long Island City, N. Y., has been incorporated with a capital of \$30,000 by P. J. Shelley, W. A. Treadwell and W. S. Brown, Brightwaters, L. I., to manufacture electric lamps and other electrical products.

The Automatic Mechanical & Novelty Corporation, New York, has been incorporated with a capital of \$30,000 by A. F. Sullivan, A. V. Rossell and C. W. Wood, 2251 Seventh Avenue, to manufacture animal traps, motor parts and other metal products.

The Perfection Radiator Co., Inc., 794 Tenth Avenue, New York, manufacturer of radiators, etc., has filed notice of dissolution.

The Petroleum Heat & Power Co., New York, has been incorporated with a capital of \$500,000 by F. M. Forbes, S. Whitaker and R. Adamson, 511 Fifth Avenue, to manufacture oil-burning appliances. It has a plant at Stamford, Conn., and will build a one-story foundry addition at an early date.

The Albany Motors, Inc., Albany, N. Y., manufacturer of motors, parts, etc., has increased its capital from \$25,000 to \$100,000.

H. Kauffman & Sons, 206 Division Street, New York, have completed plans for a three-story automobile service and repair building, 25 x 150 ft., on South Street, to cost about \$75,000.

The C. A. Bruhns-Stewart-Widder Corporation, New York, has been incorporated with a capital of \$50,000 by C. A. Bruhns, J. A. Stewart and J. L. Widder, 226 West Thirty-sixth Street, to manufacture hardware products.

The Powelson Foundry & Machine Co., New York, has increased its capital from \$200,000 to \$750,000.

The United Machine Works, 55-57 West Third Street, New York, is arranging for the purchase of machine tools, including plate bending machine, radial drill, lathes, etc., as well as milling cutters, air compressor and air drills.

The Steatite Electric Products Corporation, Yorktown Heights, N. Y., has been incorporated with an active capital of \$215,000 by T. D. Finizio, S. T. Moore and J. N. Strang, Yorktown Heights, to manufacture electric heating equipment and appliances.

The Eastern Phonograph Corporation, New York, N. Y., has been incorporated with a capital of \$100,000 by G. Seifert and S. A. Friedberg, 869 Stebbins Avenue, Bronx, to manufacture talking machines and parts.

The Trans-Marine Motor Corporation, New York, has been incorporated with a capital of \$100,000 by J. A. Lee, O. Sperling and G. Pfeil, 149 Broadway, to manufacture motors and parts for automobiles and boats.

The M. & S. Radiator Co., Albany, N. Y., has been organized by G. E. and A. N. Sperry to manufacture radiators for automobiles and other sheet metal products.

Charles P. Dickinson, Ellenville, N. Y., is organizing a company to build an electric power plant at Ulster, N. Y., for light and power service.

The International Combustion Engineering Corporation, Hastings-on-Hudson, N. Y., has been incorporated with a capital of \$10,000,000 under Delaware laws by Mitchell P. Talmage, Hastings-on-Hudson; George H. Hansell, Cranford, N. J., and George H. Loarne, New York, to manufacture engines, machinery, etc.

The New York Edison Co., Irving Place and Fifteenth Street, New York, has completed plans for a two-story electric station, 75 x 100 ft., on Cedar Street, to cost about \$150,000.

The Hodgson Electric Appliance Co., Inc., Glens Falls, N. Y., has been incorporated with a capital of \$100,000 by E. J. West, W. D. Hodgson and D. F. Imrie, to manufacture electrical equipment.

The West 158th Street Garage Corporation, New York, has leased the building on West 158th Street, near Twelfth Avenue, now in course of erection, for the establishment of an automobile service and repair works. It occupies a site 112 x 211 ft. The new owner has also taken options on an adjoining site, 100 x 135 ft., for an addition.

The Lowe-Elliott Corporation, Freeport, N. Y., has been incorporated with a capital of \$50,000 by M. H. Lowe, W. J. Martin and M. A. Elliott, to manufacture electric storage batteries and kindred products.

The International Bed Spring Mfg. Co., New York, has been incorporated with a capital of \$10,000 by D. and J.

Wagner and B. Horowitz, 103 Avenue D, to manufacture bed springs and other metal products.

Hoisting and conveying machinery, cranes, etc., will be installed at the proposed new storage yards of the Interborough Rapid Transit Co., 165 Broadway, New York, in Brooklyn. It will occupy the blocks bounded by New Lots and Stanley avenues and Elton and Linwood streets. Bids for a number of buildings have been taken, totaling about \$407,000. It is expected to have the yard ready for service late in 1921.

The United States Aluminum Co., 120 Broadway, New York, has secured about two and one-third acres fronting on the Hudson River at Edgewater, N. J., at a cost of \$25,000 an acre. It is said that the site will be used for a new plant.

The Morgan-Roche Chemical Machinery Corporation, South River, N. J., has been incorporated in Delaware with capital of \$100,000 by Thomas A. Roche and William Morgan, South River, and E. F. Couch, New Brunswick, N. J., to manufacture machinery for chemical plants, parts, etc.

The Quality Tire Co., Elizabeth, N. J., has been incorporated with a capital of \$50,000 by J. J. Cooley, Elizabeth; L. M. Ettinger, Newark, and Edward Feenane, Trenton, to manufacture automobile tires.

The Perfection Magneto Repair Co., Ridgewood, N. J., has been incorporated with a capital of \$50,000 by Harry and Andrew King and Richard Wiseman, to manufacture magnetos and ignition equipment and operate a local repair plant.

The Delaware, Lackawanna & Western Railroad Co., Hoboken, N. J., has completed plans for additions to its repair shops at Port Morris, N. J., to cost about \$150,000. The work will include a new machine shop, forge shop and extensions to the present engine house, with new 90-ft. turn-table.

Hoisting and conveying machinery and other freight-handling equipment will be installed at the proposed new terminal of the Luckenbach Steamship Co., 44 Whitehall Street, New York, in the vicinity of Weehawken, N. J. The project will include three 1200-ft. piers, with sheds, warehouses, etc., and is estimated to cost close to \$10,000,000.

Fremart, Inc., Point Pleasant Beach, N. J., has been incorporated with a capital of \$125,000 by E. N. Fries, Frank Martin and Lewis Fisher, all of Point Pleasant, to manufacture machinery and parts.

The United States Ordnance District Salvage Board, 1107 Broadway, New York, is taking bids up to 1 p.m., Aug. 16, for the property formerly used by the California Loading Co., Old Bridge, N. J., consisting of 85 buildings, with power plant, mechanical equipment, etc.

The Esda Mfg. Co., 280 Madison Avenue, New York, manufacturer of hot water heaters, gas appliances, etc., has leased a plant at Garwood, N. J., formerly occupied by the Powers & Robinson Co., for new works.

The Electric Steel Shipbuilding Corporation, West New York, N. J., has been incorporated in Delaware with capital of \$600,000 by Frank Knoton, West New York; Leander P. Sniffin, Yonkers, N. Y., and Huger W. Harvey, New York, to manufacture steel vessels of various types.

Owing to a recent zoning ordinance prohibiting the erection of a proposed addition to its plant, the United Auto Body Mfg. Co., 100 Hamilton Street, Rahway, N. J., is considering the removal of its automobile body works to Linden, N. J., where options have been taken on property. E. L. Mohn is president.

The Tidewater Oil Co., Bayonne, N. J., will expend over \$5,000,000 for development in the vicinity of the Tampico district, Mexico. Two new wells will be established, with the construction of pipe lines, tank works, etc.

The Kruger-Weeks Crane Co., Berkshire Place and Coit Street, Irvington, N. J., has filed notice of organization to manufacture small cranes, trolleys, etc. A. S. Weeks and Albert M. Kruger, 208 North Nineteenth Street, East Orange, head the company.

George H. Harman, Inc., Newark, N. J., has been incorporated with a capital of 25,500 shares of stock, no par value, by George H. Harman, Russell Fleming and James L. Handford, 790 Broad Street, to manufacture metal specialties.

Landers, Frary & Clark, Inc., New Britain, Conn., has leased the larger portion of the plant at Sussex Avenue and Dey Street, Newark, for the manufacture of metal kitchen products. The property is held by the Tuskeloid Co., manufacturer of composition novelties, which will continue to occupy a section of the factory. The new occupant proposes immediate operations and will equip the building at once.

George Brown & Co., Newark, N. J., operating a cut

stone works at 270 Passaic Street, have filed plans for a one-story brick and steel machine shop, 34 x 100 ft.

The McAllister-Canton Corporation, 1001 Broad Street, Newark, is taking bids for a two-story automobile service building, to cost about \$100,000. R. T. Short, 370 Macon Street, Brooklyn, N. Y., is architect.

The Newark Hardware & Repair Co., 147 Mulberry Street, Newark, has been organized to manufacture hardware and metal specialties. David Meyers, 123 Hillside Avenue, heads the company.

The Steib-Tahuian Co., Irvington, N. J., has been incorporated with a capital of \$100,000 by Adam Meister, J. R. Tahuian and J. G. Steib to manufacture tin and other metal products.

The Welding Engineering Service Co., 112 Newton Street, Newark, has filed notice of organization to manufacture welding equipment. M. Kiselik, 745 South Twelfth Street, heads the company.

The International Motor Truck Co., Plainfield, N. J., has arranged for expansion in present production from 10,000 motor trucks per annum to 15,000. In addition to its local plant, the company operates works at New Brunswick, N. J., comprising the former plant of the Wright-Martin Aircraft Corporation, and at Allentown, Pa.

Philadelphia

PHILADELPHIA, Aug. 2.

The Gloria Motors Corporation, 407 Shubert Building, Philadelphia, manufacturer of automobiles, is completing plans for its new plant in the vicinity of Audalusia Street and the Pennsylvania Railroad. The initial works will be two-stories, 200 x 400 ft., estimated to cost in excess of \$500,000, including equipment.

Fire, July 26, destroyed a portion of the plant of the Kensington Mfg. Co., 1109-19 North Front Street, Philadelphia, manufacturer of cotton waste, including cutting and grinding machinery, with loss estimated at \$50,000.

Blumenthal Brothers, Philadelphia, are taking bids for a one-story addition to the machine shop at their cocoa factory at Margaret and James streets, used for machinery parts, manufacture repairs, etc.

The plant and equipment of the Morton Steel Casting Co., Yale and Morton avenues, Morton, near Chester, Pa., will be sold by the trustee in bankruptcy, C. C. Montgomery, Du Pont Building, Wilmington, Del. It was formerly operated in the name of the Bowen Anchor Co., and consists of 4½ acres, with foundry, pattern shop, office and other buildings. The machinery comprises a 20-ton open-hearth furnace, with charging platform, crane ladles, foundry, forge shop and power plant equipment.

Froelich Brothers, Inc., 147 North Seventh Street, Philadelphia, manufacturer of pipe, plumbing equipment, fittings, etc., has awarded contract to Potts Brothers & Cooperson, 129 North Eleventh Street, for a one-story building on Tenth Street, near Erie Avenue, 30 x 113 ft.

Plans for a new power plant, to cost about \$175,000, have been completed by H. O. Wilbur & Sons, Inc., 235 North Third Street, Philadelphia.

The American Rubber Products Co., Philadelphia, has acquired the plant and business of Greenwalt & Cohn, 1734 North Fifth Street, manufacturer of kindred products, and will establish headquarters at this location.

The Commercial Truck Co. of America, Inc., Twenty-seventh and Brown streets, Philadelphia, manufacturer of motor trucks, is taking bids for a new one-story building at Hunting Park Avenue and Rising Sun Lane, to cost about \$25,000. The main factory, on which superstructure work has begun, will be two-stories, and is estimated to cost about \$150,000.

The Philadelphia Roll & Machine Co., Twenty-third Street and Washington Avenue, Philadelphia, is taking bids for a one-story works, 90 x 100 ft., at Fifty-second Street and Grays Avenue.

The Queen-Gray Co., 618 Chestnut Street, Philadelphia, manufacturer of scientific instruments, is planning for the installation of a number of machine tools.

The Joseph Stokes Rubber Co., Taylor and Webster streets, Trenton, N. J., manufacturer of mechanical rubber products, has increased its capital from \$300,000 to \$5,050,000. It recently acquired property on Taylor Street for additions. Charles E. Stokes is president.

The Victor Talking Machine Co., Camden, N. J., is taking bids up to Aug. 10 for an addition to its power plant. Ballinger & Perrot, Seventeenth and Arch streets, Philadelphia, are architects.

The International Motor Truck Co., Race Street, Allen-

town, Pa., will soon take bids for a one-story addition, 300 x 500 ft.

The Bour Refractories Co., Laurel Line & Front Street, Scranton, Pa., is arranging for a new three-story plant on Stafford Avenue, 90 x 200 ft., reinforced-concrete and steel, to cost about \$300,000, including equipment.

The Frick Co., Waynesboro, Pa., manufacturer of agricultural implements, machinery and parts, etc., has completed plans for a one-story foundry, 150 x 300 ft., and two-story pattern shop, 80 x 100 ft., on West Main Street.

E. R. Caldwell & Co., Bradford, Pa., have been incorporated with a capital of \$300,000, to manufacture machinery, machine parts and tools. V. H. Oxley is treasurer.

The Hahn Motor Truck Co., Hamburg, Pa., manufacturer of motor trucks and bodies, has increased its capital from \$50,000 to \$200,000. W. G. Hahn is president.

The Gray Iron Foundry Co., Reading, Pa., has awarded a contract to W. E. Spatz, Reading, for a one-story addition on Tilpenhocken Street, 60 x 120 ft., to cost about \$20,000.

The Anthracite Electric & Welding Co., Pottsville, Pa., has been incorporated with a capital of \$20,000, to manufacture welding equipment. Martin L. Dunn is treasurer.

The Hunter Motor Car Co., 27 South Second Street, Harrisburg, Pa., recently organized to manufacture automobiles, will increase its capital stock to \$121,000. Its proposed plant will be designed for a capacity of about 100 pleasure automobiles per month, and erection of the first unit will begin at an early date. The company has acquired an automobile machine shop, where test work and other preliminary operations will be conducted. C. H. Hunter is president and general manager.

The Landis Tool Co., Waynesboro, Pa., has arranged for the closing of its plant for two weeks, beginning Aug. 1. It has been making small reductions in its working force the past few weeks and it is said that the temporary shutdown is due, primarily, to cancellation of orders.

The Siphon-Valve Flush Co., Allentown, Pa., has been organized to manufacture valves, flush tanks and kindred specialties. It is headed by Charles L. Lehnert, Catasauqua, and Joseph F. Seeds, Allentown.

The Johnson Bronze Co., South Mill Street, New Castle, Pa., has taken bids for extensions to its plant, to cost about \$100,000. P. J. Flaherty is general manager. Frank Chase, Inc., 122 South Michigan Avenue, Chicago, is engineer.

The York Mfg. Co., York, Pa., manufacturer of refrigerating machinery, ice-manufacturing equipment, etc., has acquired the former plant of the York Brewing Co., which it will use for experimental and testing departments, and certain features of general production.

The H. A. Gable Co., Harrisburg, Pa., has been incorporated with a capital of \$300,000 by Harper W. Spong, E. L. Cowden and G. G. Golling, all of Harrisburg, to manufacture hardware and kindred products.

The Edison Lamp Works of the General Electric Co., 129 Broadway, New York, is planning for an addition to the plant of the Scranton Textile Co., Scranton, Pa., recently acquired. It will be three stories, 100 x 100 ft., and is estimated to cost about \$200,000.

The Lykens Valley Light & Power Co., Philadelphia, has arranged for a bond issue of \$37,000 for extensions.

New England

BOSTON, Aug. 3.

Although business tapered off during the last half of July, a number of machine tool houses here report very satisfactory bookings for that month. There are enough tools under negotiation, that probably will be closed on, to give August a fairly good start, yet common opinion is that the next fortnight will witness a further falling off in transactions. A considerable number of machine tool users, who have asked dealers for prices on equipment, frankly admit that nothing will be bought within the immediate future. They say, however, they possibly will bring up the question of purchases again early in September, and for that reason local dealers are by no means pessimistic. Then, too, cancellations from users in this section of the country have been remarkably few and in almost all cases unimportant. But here and there a New England machine tool builder reports cancellations from outside industries. Deliveries are growing steadily better, although on certain tools they are not improving, yet the movement of new equipment into these states is constantly disrupted by railroad embargoes and congestion of cars at New England freight gateways, some tools shipped from the Middle West in March not having arrived, and buyers and sellers alike are disgusted with transportation conditions. Prices for new tools hold strong. Collections are slower, but no uneasiness is felt.

The General Electric Co., West Lynn, Mass., has bought a die filing and other machines against its last list, which is about two-thirds placed. The Manomet Mills, New Bedford, Mass., cotton knitting yarns, is expected to close on its list of 16 repair shop tools before the end of another week. The Saco-Lowell Works, Boston, cotton mill machinery, has bought three 20-in. crank shapers, and has been showing some interest in second hand shop equipment. In connection with the cotton mill machinery industry, it is interesting to note that Japanese representatives have been and are buying equipment standing in mills rather than wait for deliveries of new equipment. One large Rhode Island cotton machinery manufacturer has notified its 1400 employees on strike that the plant is closed indefinitely and probably will not open until fall. These and other developments probably in a large measure account for the slowing up in machine tool buying by the cotton machinery industry. The United Shoe Machinery Corporation, Boston and Beverly, Mass., has not been a factor in the machine tool market the past week, but inasmuch as shoe manufacturers report an improved demand for spot and fall business, machine tool dealers anticipate they, as well as the shoe machinery corporation, will be interested in new equipment before long.

The Northway Motors Corporation, Natick, Mass., has bought two or three tools, including a Cincinnati vertical miller. This company is compiling a large list of tools for crank shaft and wheel work and probably will ask for estimates during the coming week. A southern New England boat building concern is expected to close on a fairly good list of floating machine shop equipment before the end of another week. The Fore River Works, Bethlehem Ship Building Corporation, Ltd., Quincy, Mass., closed on its lathe requirements, fairly prompt delivery being guaranteed. A concern contemplating the manufacture of automobile wheels is figuring on a good list of equipment, but is not ready to make public its requirements. The Crofoot Gear Works, Hyde Park, Mass., contemplates the purchase of a gear hopper. The Lime Rock Railroad, Maine, has bought 16-in. x 8 ft. Flather lathe equipment with taper attachment, and a Hartford, Conn., machine tool builder three pieces of wood-working machinery. Other sales reported include a milling machine by the United States Cartridge Co., Lowell, Mass., several new tools by the Trimont Mfg. Co., Boston, wrenches, etc., which also has shown some interest in war surplus board offerings; a drill by an optical company; and a small drill by the American Marine Hardware Corporation, Portland, Me. The Noiseless Typewriter Co., Middletown, Conn., and the Cowles & Co., New Haven, Conn., carriage hardware, are in the market for Bliss presses.

The Davitt Iron Foundry, Springfield, Mass., has purchased a 5-ton, 29 ft. span crane. The crane market otherwise is dull and featureless.

The Hendey Machine Co., Torrington, Conn., lathes, etc., closed July 30, and will remain so until Aug. 9, its usual vacation period.

The Golden Co., New York, is seeking a Boston representative for a line of precision measuring tools made in Switzerland.

Harold A. Wright, 201 Devonshire Street, Boston, has been made agent for the Robinson adjustable point center, manufactured by the Cleveland Center Co., Cleveland.

The General Optical Co., Mount Vernon, N. Y., contemplates building an addition to its Tilton, N. H., plant.

The proposed \$100,000 brass foundry to be erected by the Fritzell Brass Works, New Haven, Conn., is in abeyance, because of the company's recent purchase of the Alexander Bros. plant, Middletown Avenue, that city.

Bids are in for additions to cost \$500,000, to the Lafayette Worsted Co. plant, Woonsocket, R. I.

The one-story, 56 x 108 ft., addition to the Davitt Iron Foundry, Springfield, Mass., is in the process of erection.

A permit has been granted the Farrel Foundry & Machine Co., Waterbury, Conn., to erect a one-story, 43 x 180 ft., addition to its plant on Bank Street.

Work has been started on the five-story, 110 x 360 ft., warehouse, garage and machine shop being erected for the Great Atlantic & Pacific Tea Co., Somerville, Mass., on Pittsburg Street.

The Standard Oil Co. of New York will soon start the erection of a garage and repair shop, 75,000 sq. ft., in Cambridge, Mass., to cost \$150,000.

Plans are being drawn for a brick one-story, 200 x 230 ft., saw tooth roof plant for the Walker & Pratt Mfg. Co., Watertown, Mass., house heating boilers, etc.

The Berbecker & Rowland Co., Waterbury, Conn., upholsterers' hardware, has awarded a contract for a three-

story and basement, 41 x 176 ft., addition to its plant to cost \$150,000. Steam power will be used.

The North & Judd Mfg. Co., New Britain, Conn., buckles, etc., has completed the purchase of the W. & E. T. Fitch Co., New Haven, Conn., buckles, etc., for \$216,000. The Fitch property, 192 x 350 ft., is at 151 East Street, New Haven.

F. H. Payne, president Greenfield Tap & Die Corporation, Greenfield, Mass., announces that plans are complete for enlarging the company's forge shop at Turners Falls, Mass., by two new buildings, to be erected at once. The company's proposed new five-story plant at Greenfield is held up for the time being.

Work on the one-story, 198 x 254 ft., manufacturing building and one story, 30 x 30 ft., boiler house, for the Peterboro Co., Peterboro, N. H., to be leased by the Eastern States Packing Co., is well under way. The Dillon Boiler Works, Fitchburg, Mass., has the contract for the boilers. Local electric power will be used.

Louis Lepoutre, Roubaix, France, vice-president and director, Lafayette Worsted Co., Woonsocket, R. I., has purchased about eight acres between Manton Avenue and the railroad, near Atwell's Avenue, Olneyville, R. I., on which a large plant is to be erected as soon as possible for the manufacture of woolen and worsted yarns by the French and Belgian processes. The new mill probably will contain a machine shop.

The Milford Shipbuilding Co., Milford, Conn., recently organized at \$100,000, has bought 22 acres on the Housatonic River, where a plant for the construction of coastwise trade boats will be developed.

The Sandford Riley Stoker Co., Ltd., Worcester, Mass., has removed from 25 Foster Street to its new plant on Neponset Street, where the sales and engineering departments also will be located. In the future the company anticipates building on the West Boylston Street side.

The Northern Mfg. Co., New Haven, Conn., has been incorporated with a capital of \$50,000 by John Hugo, 296 Central Avenue; C. O. Beck and J. T. Hines, all of New Haven, to manufacture machinery and parts, hardware products, etc.

The State Highway Commission, Augusta, Me., has awarded a contract to T. F. Moreau & Co., 468 Lisbon Street, Lewiston, Me., for a two and three-story machine shop and automobile service works, 80 x 400 ft., on Grove Street, to cost about \$250,000, including equipment.

The Standard Nut & Bolt Co., Valley Falls, R. I., is considering the erection of a one-story and basement addition, 60 x 80 ft.

The Baker Gun Co., Norwich, Conn., has been incorporated with a capital of \$150,000 by R. C. Brown, Sound Beach, Conn.; H. T. and H. L. Folsom, Orange, N. J.; and Alfred Blackburn, to manufacture shotguns and other firearms.

The Economy Mfg. Co., 886 Main Street, Bridgeport, Conn., manufacturer of spark plugs, is arranging for the construction of a new plant on Brewster Street, to cost about \$75,000.

The Homer D. Bronson Co., Beacon Falls, Conn., manufacturer of brass and bronze products, has increased its capital from \$100,000 to \$150,000.

The Nicholson File Co., Providence, R. I., has plans for a one-story shop addition.

The Hartford Auto Club Garage Co., 36 Pearl Street, Hartford, Conn., is completing plans for its seven-story service building, 147 x 150 ft., at Hicks and South Ann streets, estimated to cost about \$500,000, including equipment.

The F. L. McDermott Iron Works, New Haven, Conn., recently organized, is planning for the early removal of its plant to a new location in the city for increased capacity. It is headed by James Managan, president; F. L. McDermott, treasurer and general manager, and James McDermott, vice-president. F. L. McDermott formerly was manager for the New England Iron Works, New Haven.

The Springfield Automatic Machine Co., Fitchburg, Mass., has acquired about four acres at West Springfield, Mass., as a site for a new plant. Details are now being arranged. Isaac T. McGregor is treasurer. It is said that the project will cost about \$200,000.

J. C. Rhodes & Co., Inc., 123 Front Street, New Bedford, Mass., manufacturer of metal eyelets and kindred specialties, has completed arrangements for a new four-story plant at Fourth and Front streets, 70 x 200 ft., to cost about \$200,000.

The Elm Garage Co., 243 Elm Street, Holyoke, Mass., is planning for the erection of a new two-story, reinforced concrete service building and repair works at Elm and Cabot streets, to cost about \$65,000.

The Vera Air Compressor Co., Bridgeport, Conn., has been incorporated with a capital of \$50,000 by Wilson Goodrich and J. W. Scheffer, 886 Main Street, to manufacture air compressors and kindred products.

The New Haven Hardware Specialty Co., New Haven, Conn., manufacturer of hardware products and metal specialties, has increased its capital from \$20,000 to \$100,000.

The N. O. & O. Machine Co., Ansonia, Conn., has filed notice of dissolution. Affairs of the company will be handled by F. W. Holden.

The Motor Sales Co., 514 Pleasant Street, New Bedford, Mass., has completed plans for a two-story service and repair works on Purchase Street, to cost about \$10,000.

The new two-story addition to the plant of the E. J. Manville Machine Co., East Main Street, Waterbury, Conn., will cost about \$65,000 and will be 50 x 200 ft. The Torrington Building Co., Water Street, Torrington, has the contract.

The American Metal Parts Corporation, 28 Brighton Avenue, Boston, 34, Mass., manufacturer of precision piston rings, is in the market for 20 14-in. swing lathes or semi-automatic lathes.

Chicago

CHICAGO, Aug. 2.

While the market continues dull, a number of fair-sized industrial orders have been placed and several additional inquiries have been received. The Ajax Forge Co., Chicago, which recently put out a list, published in this column on July 1, has closed for one 3000-lb. double frame steam hammer, a 2000-lb. steam drop hammer, a large guillotine shear, a 10-ton gantry crane, and a 2-ton crane, amounting to about \$40,000. The Wall Pump & Compressor Co., Quincy, Ill., recently organized with \$200,000 capital stock, has bought \$25,000 worth of equipment, including a large plain milling machine, large universal milling machine, radial drill, shaper, high-speed drill, two drill presses, universal tool grinder and four engine lathes. The Duplex Vacuum Motor Co., 4513 South Halsted Street, Chicago, has placed an order for \$9000 worth of machine tools.

The Chicago & North Western has issued a list, calling for one motor-driven upright drill press with 42-in. swing and 36-in. table, 42-in. steel tire turning lathe, wet tool grinder, double head emery grinder, 14-in. motor-driven upright drill, belt-driven emery wheel stand and a 42-in. extra heavy earwheel boring machine arranged for belt drive. The Burlington is inquiring for a motor-driven spring setting machine, a No. 3 Mason, or equivalent, motor-driven washer cutting machine, and a 36-in. motor-driven vertical turret lathe. The Rock Island wants a 36-in. x 12 ft. engine lathe arranged for belt drive and an Oster power pipe and nipple threading machine. The Santa Fe has issued an additional inquiry calling for a 6-ft. plain heavy duty radial drill and a 24-in. sensitive drill. The Illinois Central is expected to enter the market for considerable equipment, and it is probable that the Elgin, Joliet & Eastern will order a few machines. The Metropolitan Elevated Railroad Co. is inquiring for a doublehead motor-driven 48-in. or 52-in. vertical boring mill.

Owing to the transportation situation dealers are still experiencing considerable difficulty in getting shipments through from manufacturers. Recent reports from Cincinnati, where a strike has interfered with production, indicate that deliveries from some shops will soon be on a normal basis. Movements of machinery out of store are still interfered with by a teamsters' strike, but early improvement is looked for as a result of the organization of the Machinery Dealers' Association of Chicago. This body is representing the dealers in the present difficulty, and no doubt will make arrangements for its own teaming service if the strikers do not abandon their demands.

Sellers find collections rather troublesome, but cancellations are not general and are usually the result of delayed deliveries on old purchases.

L. I. Yeomans, formerly vice-president Amalgamated Machinery Corporation, Chicago, has joined with others in organizing the American Metal Products Co., which is equipping a shop at 1331 West Washington Boulevard, for the manufacture of automotive parts. The company has bought about \$25,000 worth of machine tools, as was reported anonymously a week ago, and will commence production in a few weeks. Mr. Yeomans is president.

The Wall Pump & Compressor Co., Quincy, Ill., has been incorporated with \$200,000 capital stock. George Wall, formerly secretary Gardner Governor Co., Quincy, is president of the new concern and others who were identified with the Gardner company are associated with him.

The M. B. Austin Co., manufacturer of electrical supplies, 700 West Jackson Boulevard, Chicago, has purchased a lot,

91 x 118 ft., at 108-116 South Des Plaines Street, and will erect a two-story factory to cost \$100,000.

The Continental Can Co., 111 West Washington Street, Chicago, has purchased a tract, 188 x 494 ft., on the corner of Grand and Kilpatrick avenues. It now owns two blocks from Grand Avenue to North Avenue, and from Kilpatrick Avenue to the Chicago Belt Railroad, part of which is improved with large buildings to which extensive additions will be made.

The Charles H. Mills Foundry Co., 2443 West Twenty-first Place, Chicago, has purchased the block bounded by Thirty-fifth and Leavitt streets, Thirty-fifth Place and Irving Avenue, and will erect a plant, 100 x 200 ft., to cost \$150,000.

The Independent Button & Machine Co., Ravenswood and Montrose avenues, Chicago, is receiving bids through the Francis M. Barton Co., 304 South Wabash Avenue, on a three-story extension, 49 x 55 ft., to cost \$45,000.

The A. M. Finkl & Sons Co., 1326 Cortland Street, Chicago, has let contract for a one-story forge shop, 36 x 100 ft. at 1306 Cortland Street.

The A. L. Hanson Mfg. Co., manufacturer of metal specialties, has purchased a two-story factory building, 38 x 125 ft., at the corner of West Ravenswood and Winnemac avenues, Chicago.

The Glacier Machine Mfg. Co., manufacturer of icemaking machines, has leased a plant at Ravenswood, Schreiber, Devon and Hermitage avenues, Chicago.

The Consumers' Graphite Co., 3033 Doyle Place, South Chicago, is effecting arrangements for the purchase of its site from the Pennsylvania Railroad. The plant is being remodeled and a switch track will be laid this summer. The company is now producing 30 barrels of ingot mold wash per week, which it sells to steel plants in this district.

The Wright Carriage Body Co., Moline, Ill., has awarded contract for the construction of a four-story plant addition, 110 x 210 ft., to cost \$100,000.

The Upton Machine Co., St. Joseph, Mich., is erecting a one-story machine shop, 90 x 175 ft., to cost \$75,000.

The International Harvester Co., 606 South Michigan Avenue, Chicago, will soon commence the construction of a motor truck plant at Fort Wayne, Ind., consisting of a three-story L-type building and several one-story structures.

The Square Tool Corporation, Peoria, Ill., has been incorporated to manufacture a tool which will drill a square hole in one operation. Directors include Carl H. Schmidgall, the inventor, who is president of the company; Fred W. Sommer, vice-president; J. L. Richart, sales manager; Albert Triebel, W. F. Schoennemeyer, H. D. Morgan and A. H. Addison. A factory will be built.

The Republic Machinery Co., Rockford, Ill., has been incorporated by A. M. Mattison, secretary Mattison Machine Works, Rockford, C. L. Mattison, treasurer of the same company, and Joseph O'Leary, Chicago, to manufacture machinery. The main office will be 209 South State Street, Chicago.

Floyd Niebergall has taken possession of the Paw Paw Machine Shop, Paw Paw, Ill.

F. A. Bushnell, purchasing agent of the Great Northern Railroad, St. Paul, Minn., has sent out an inquiry for the following: 166 spout hoist machines, complete, with adjustable base plates and sheet iron covers; 18 steel motor pinions, 9-in., P.D. 3 D.P. 4-in. F. bored for 2½-in. diam. shaft key way ½-in. x 3/16-in.; 18 steel spur-gears, 33-in. P.D. 3 P.D. 4-in. F., 4½-in. hub, 6 spokes bored and keyed for 7/16-in. diam. shaft; 18 sets C. I. hand-power auxiliary bearings with steel shaft and pinion; 4 cast steel hand cranks for hand-power auxiliary; 1992 lin. ft. cold rolled steel line shafting, 27/16-in. diam. in 18 runs (14 x 108 ft. and 4 x 120 ft.) with Grundy flexible couplings and emergency compression couplings, the entire shafting to be complete with keys and key ways; 82 intermediate line shaft bearings; 166 steel ore spouts, as per drawing 224-2904-17; 166 steel ore pocket doors, complete with locking levers, as per details on drawing 224-2904-16; 166 sets of steel ore spout supports and door frames complete, as per details on drawing 224-2904-15.

The Plamondon Mfg. Co., 24 North Clinton Street, Chicago, manufacturer of friction clutches and other power equipment, is taking bids for a two-story building, 60 x 100 ft., at 5301 South Western Avenue, to cost \$50,000.

Fire, July 15, destroyed part of the plant of the Monarch Cabinet Co., Rockton, Ill., with loss of \$50,000, including equipment.

The Wright Carriage Body Co., Twenty-first Street and Third Avenue, Moline, Ill., has filed plans for a four-story addition, 110 x 210 ft., to cost \$100,000.

The Russell Grader Mfg. Co., 2037 University Avenue, Minneapolis, has plans well under way for its proposed new

one-story plant, 425 x 600 ft., on Kennedy Street, near Stinson Boulevard, estimated to cost \$250,000 with equipment. Sund & Dunham, Essex Building, associated with E. R. Ludwig, are architects.

The Hennepin Atomized Fuel Co., 500 Security Building, Minneapolis, has filed plans for a one-story crushing plant at Broadway and Johnstown Street, to cost \$145,000, including machinery.

The new plant of the American Forge Co., 2503 Blue Island Avenue, Chicago, estimated to cost \$300,000, will consist of five buildings, as follows: Two, 40 x 80 ft.; 65 x 120 ft.; 30 x 80 ft., and 20 x 40 ft.

Buffalo

BUFFALO, Aug. 2.

A department for vocational training of teachers will be established at the State Normal School, Buffalo, instruction to commence in September. The branches will include machine shop work, sheet metal operations, electrical work, wood-working and other departments. The State Department of Vocational Training will be removed from Albany to this point and equipment used here taken to Buffalo. About \$18,000 will be expended for additional machinery. Harry W. Rockwell is principal.

The Jones Oil Engine Co., 227 Walton Street, Syracuse, N. Y., has completed plans for a new plant on Free Street, 90 x 260 ft., to cost about \$60,000.

P. L. Pease & Co., Inc., Root Building, Buffalo, manufacturer of furnace and heating equipment, has filed notice of reorganization with an active capital of \$105,000.

The Smith Wheel Co., 100 North Geddes Street, Syracuse, manufacturer of automobile wheels, rims, etc., has awarded a contract to Dawson Brothers, Union Building, for a two-story addition, 62 x 70 ft., and 40 x 106 ft.

The Malone Light & Power Co., Malone, N. Y., will issue bonds for \$100,000, part of the proceeds to be used for the erection of an addition to its electric power plant.

Plans for the erection of a new power house for general works service are being considered by the Oswego Falls Pulp & Paper Co., Fulton, N. Y., at its plant at Hinckley, N. Y.

The Medina Hoke Tractor Co., Medina, N. Y., manufacturer of motor-operated tractors, parts, etc., has filed notice of dissolution.

Leonard Meyer, 177 High Street, Buffalo, has awarded contract to William Rhode, 680 Elm Street, for a new metal working plant, three stories, 32 x 100 ft., on High Street, to cost about \$30,000. A forge shop will be installed in connection with other departments.

The T. N. Benedict Mfg. Co., East Syracuse, N. Y., manufacturer of silver plated ware and other metal specialties, has increased its capital to \$150,000.

The E. Z. Fire Starter Co., Johnstown, N. Y., has been incorporated with a capital of \$100,000 by F. H. Ramsey, F. Lynes and G. O. Smith, to manufacture special mechanical equipment.

The Jamestown Malleable Products Corporation, Jamestown, N. Y., has completed plans and will call for bids at once for its new one-story iron foundry at Falconer, N. Y., estimated to cost about \$300,000, including equipment.

The Central South

ST. LOUIS, Aug. 2, 1920.

The Hoxie-Walnut Ridge Compress Co., Walnut Ridge, Ark., will purchase about \$30,000 worth of equipment for its plant.

The Western Tablet Co., Eleventh and Mitchell streets, St. Joseph, Mo., will erect a power-house, 40 x 100 ft.

The Arkansas Oil Refining Co., Fort Smith, Ark., J. H. Hebold, Okmulgee, Okla., president, will spend about \$200,000 for improvements in its refinery.

The Home Light & Ice Co., Cleveland, Miss., is in the market for about \$30,000 worth of equipment.

The Kansas City Refrigerating Co., Kansas City, Mo., F. W. Howden, president, will erect a two-story addition, 80 x 200 ft., and is in the market for equipment.

The St. Louis & San Francisco Railroad Co., F. G. Jonah, St. Louis, chief engineer, will erect roundhouses and machine shops at Monett and Newburg, Mo.

Smith Brothers, Owensboro, Ky., are having plans prepared by C. W. Kimberlin, architect, Odd Fellows' Building, for a new one-story machine shop, 80 x 120 ft.

The Mercury Body Corporation, 705 Security Trust Build-

ing, Lexington, Ky., recently incorporated with a capital of \$100,000, has leased a building and will establish a plant for the manufacture of automobile bodies. The initial machinery installation is estimated to cost about \$20,000. K. G. Pulliam, Sr., is president.

The Bowen Motor Railway Co., Title Guaranty Building, St. Louis, manufacturer of railroad equipment, is having plans prepared for a two-story plant, 83 x 410 ft., at Maplewood, Mo., to cost about \$250,000. A. D. Bowen is president.

The Haller-Troutman Brothers Motors Co., 2613 Cane Run Road, Louisville, recently organized, is planning for the erection of a new machine and repair works. Some new equipment will be installed. George Haller is president and W. J. Troutman, vice-president.

The Sooner Battery & Electric Co., Okmulgee, Okla., has been incorporated with a capital of \$10,000 by Bert C. Campbell, Lee W. Cotter and O. J. Hannigan, to manufacture batteries and other electrical products.

The Individual Electric Grinder Co., Oklahoma City, Okla., has been incorporated with a capital of \$10,000 by J. M. Stivers, G. W. Ruby and A. L. Escalante, to manufacture electrically operated grinding machinery and other appliances.

The Pennsylvania Tank Car Co., 915 Republic Building, Kansas City, Mo., has awarded a contract to the Wisconsin Bridge & Iron Co., 4202 Walnut Street, for its new tank car and repair works on Carlisle Road, Kansas City, Kan. Two main buildings will be constructed, each 80 x 220 ft. William C. Holt is in charge.

The American Auto-Lock Co., Oklahoma City, Okla., has been incorporated with a capital of \$25,000 by J. H. Hill, Oklahoma City; J. S. Inlaw and G. A. La Brant, Tulsa, to manufacture special locks and locking devices for automobile service.

Cleveland

CLEVELAND, Aug. 2.

The market continues very dull as far as actual orders go, but one or two dealers report a little better volume of inquiry. With some manufacturers July sales were fewer than in any previous month since before the war. Some dealers who are receiving deliveries on stock orders are getting a better volume of single tool orders owing to the fact that they can make immediate deliveries which are now desired by practically all buyers. Shipments of machinery have been held up by one or more Akron tire manufacturers who are making radical retrenchments and in some cases have asked manufacturers to cancel orders. In other field, deliveries on tools have been extended because buyers have not completed extensions.

In spite of the present dullness there is an improvement in the volume of prospective business. Several inquiries have come out for fairly large size lots of machine tools, but most of these are in rather indefinite form and have been sent out for estimating purposes. It is not expected that many of these inquiries will lead to orders until there is a marked change in the financial situation. One definite inquiry has come out for equipment for tire making machinery, which includes boring machines, two planers and a 6-ft. radial drill, as well as smaller tools. The Willys-Overland Co. has placed orders for several tool room lathes.

At the auction sale of machine tools and other surplus war material held by the Toledo District Ordnance Salvage Board, War Department, last week, every item in the catalog was disposed of. Almost the full market prices were paid for the longer bed engine lathes, automatic screw machines and drill presses. Good prices were also secured for steel tanks. It is estimated that the machine tools disposed of brought on the average 75 per cent of their market value when new. A number of special machines used in machining shells were sold on a tonnage basis, the prices ranging from \$29 to \$32 per gross ton. About 150 active bidders attended the sale, and it is estimated that 55 per cent of the materials disposed of went to users of the tools, and the remaining 45 per cent to dealers in secondhand machinery.

The Wellman-Seaver-Morgan Co., Cleveland, has commenced the erection of a 200-ton fitting out crane for the New York Shipbuilding Corporation, to be installed at Camden, N. J. The order was placed about a year ago but was held up soon after and now has been released.

The Nickel Plate Foundry Co., Cleveland, plans the erection of a foundry addition, 80 x 70 ft.

The Motor Repair & Mfg. Co., 216 High Avenue, Cleveland, plans the erection of a one-story building, 60 x 80 ft.

The Toledo Bridge & Crane Co., Toledo, Ohio, has been purchased by the Austin Machinery Corporation, which will operate the plant with the present personnel. The Austin

corporation, of which B. A. Linderman is president, has plants in Chicago and Michigan, where it manufactures road machinery. The Toledo plant will continue the manufacture of cranes in addition to new lines of work for the Austin products. It is stated that the Austin corporation bought the common stock issue of the Toledo company for \$155,000 par value. C. A. Peckham will remain as president, and Carl Horix, vice-president and general manager of the Toledo company.

The Willys-Overland Co., Toledo, Ohio, is placing contracts for a new foundry at Fostoria, Ohio, to make castings for the Auto-Lite Co., an allied organization. It will be of brick and steel 141 x 241 ft.

The Lange Boiler Co., Elyria, Ohio, has been incorporated with a capital stock of \$100,000 by H. J. Lange, Lorain; J. A. Lucas, Elyria, and others. It contemplates the erection of a plant for the manufacture of steam and hot water boilers.

The Transue-Williams Steel Forge Corporation, Alliance, Ohio, manufacturer of drop forgings and sheet metal stampings has placed contract with the H. K. Ferguson Co., Cleveland, for a one-story brick and steel foundry, 100 x 200 ft.

The McNeil Boiler Co., Akron, Ohio, has increased its capital stock from \$100,000 to \$500,000.

The Universal Crane Co., Elyria, Ohio, recently organized to manufacture small cranes for use on motor trucks, is having plans prepared for a plant 80 x 200 ft. It is understood that some equipment will be purchased shortly.

The Miller Pasteurizing Machinery Co., Canton, Ohio, is contemplating the erection of a new one-story plant.

Indianapolis

INDIANAPOLIS, Aug. 2.

The Pioneer Truck Co., Valparaiso, Ind., has completed arrangements for a plant, the first unit of which will be 100 x 300 ft. Otto M. Freier is president and Richard Vogel, secretary.

The Kendallville Foundry, Kendallville, Ind., is constructing a new plant, 110 x 140 ft.

The Columbia Iron Works, Columbia, Ind., has increased its capital stock from \$75,000 to \$125,000.

The Wert Mfg. Co., recently incorporated with \$525,000 capital stock, will manufacture concrete machinery at Kendallville, Ind. New equipment will be installed in a plant in that city and operation will commence by Sept. 1. Work has been started on a warehouse, 50 x 120 ft., to cost \$20,000. The officers are J. Wilber, Chicago, president; C. S. Wert, Kendallville, vice-president and general manager; S. Runner, Chicago, secretary; A. M. Jacobs, Kendallville, treasurer.

The Kokomo Malleable Iron Co., Kokomo, Ind., has increased its capital stock from \$350,000 to \$500,000.

The Frankfort Toy & Mfg. Co., Frankfort, Ind., has been incorporated, with \$260,000 capital stock to manufacture toys and mechanical devices. The directors are John A. Benell, Thomas H. Campbell and William G. Himmelwright.

The Plymouth Metal Working Co., Plymouth, Ind., has been incorporated, with \$50,000 capital stock, to manufacture metal products. The directors are Fred E. Lang, Albert G. Ziesek and Charles J. Ruebling.

The Van Briggle Motor Device Co., Indianapolis, has increased its capital stock from \$500,000 to \$800,000.

The Ohio Valley Casket Mfg. Co., Lawrenceburg, Ind., has increased its capital stock \$25,000 for the purpose of enlarging its plant.

The steel separator plant of the Advance-Rumely Co., now at Battle Creek, Mich., will be moved to the main plant of the company at Laporte, Ind.

The Parker Tire & Rubber Co., 2461 Allen Avenue, Indianapolis, is completing plans for the second unit of its tire plant, a two-story factory, 100 x 600 ft. at 2700 Allen Avenue, estimated to cost \$300,000, including equipment. Construction to start about Sept. 1. Paul P. Parker is president.

The Kokomo Malleable Iron Co., Kokomo, Ind., is planning a one-story plant for the manufacture of malleable iron castings. W. G. McCoy, Kokomo, is engineer.

The Union Railroad Equipment Co., 332 South Michigan Avenue, Chicago, is having plans prepared for a one-story plant at Hammond, Ind., 75 x 125 ft., brick and steel, to be equipped as a forge shop, to cost \$125,000. F. D. Chase, Inc., 645 North Michigan Avenue, Chicago, is engineer.

The Campbell Wire Specialty Works, South Bend, Ind., has filed plans for a one-story plant, 65 x 165 ft., to cost \$50,000.

The new plant of the Van Briggle Motor Device Co., 429 Capitol Avenue, Indianapolis, to be located at Mooresville,

Ind., is estimated to cost about \$200,000, including equipment. The factory will be two and three stories. C. E. Bacon, 617 Merchants Bank Building, Indianapolis, is architect.

Cincinnati

CINCINNATI, Aug. 2.

The machinery market continues dull though manufacturers of milling and radial drilling machines state that business booked in the month of July was equal to that of May and June. Lathe manufacturers report a slowing up as compared with the first two weeks of the month. A few cancellations are being received each day, but these are confined largely to automobile accessory manufacturers. Makers of specialty tools, such as jigs, dies, etc., have received a number of requests to hold up work on orders already placed and one automobile manufacturer has written a local firm asking if it would consent to a cancellation of his order for small tools. Manufacturers generally take the view that the present slack period is but temporary and partly due to the financial situation.

A number of local manufacturers are arranging exhibits for the Olympia Exposition at London and the exposition at Lille, Belgium, and this city will be well represented at the exposition at Buenos Aires in November. Reports from agents in Europe indicate that there is a heavy latent demand for American machine tools and as soon as the exchange situation becomes more favorable more buying will result. Regarding the prospects of trading with Russia, an official of one of the largest concerns in the city does not think that much will be done for some time, or at least until more satisfactory assurances are made that protection will be afforded persons desirous of visiting that country for commercial purposes.

The American Blower Co. has purchased the foundry of the Lane & Bodley Co. at Tennessee Avenue and the Baltimore and Ohio Railroad in the Bond Hill section of Cincinnati. It is stated that it contemplates the removal of its foundry department from Detroit to this city. Labor conditions in Detroit are said to have had a great deal to do with the decision of the company to locate in Cincinnati. The property purchased includes 21 acres, with buildings containing about 90,000 sq. ft. of floor space. It is the intention to take immediate possession of the property and by the first of the year 500 men will be employed.

The Midwest Tool & Engineering Co., Hamilton, Ohio, recently incorporated, has established a plant at 222 North B Street and has commenced operations. It will manufacture dies, jigs, gages and special machinery. O. A. Koogler is president.

The Advance Bed Parts Co., Chicago, will be moved to Miamisburg, Ohio, shortly and will be located in part of the plant formerly occupied by the Dayton-Wright Aeroplane Co. Harry Block, president of the Mutual Mfg. Co., which recently moved from Dayton to Miamisburg, is president.

The Ashland Malleable Co., Ashland, Ohio, has been incorporated with a capitalization of \$150,000 by J. H. Firestone, O. D. Firestone, E. M. Armstrong, B. F. Swinehart, W. P. Topping and S. Miller.

The Dayton Pump & Mfg. Co., Dayton, Ohio, will increase its capitalization from \$1,300,000 to \$1,500,000 to complete several new buildings now under construction, made necessary by expanding business.

It is reported that the main shops of the Detroit, Toledo & Ironton Railroad, recently purchased by Henry Ford, will be removed from Jackson, Ohio, to a more central location. Nothing definite is expected for some months.

The Cincinnati Tool Co., 1951 Waverly Avenue, Norwood, Ohio, is taking bids for its proposed new one-story machine shop, 50 x 146 ft.

The Edwards Mfg. Co., Third and Eggleston avenues, Cincinnati, metal products for building construction, is having plans prepared for a four-story building, 95 x 305 ft.

The Maumee Refining Co., Toledo, Ohio, has completed plans for a new refining plant, with initial capacity of about 1,000,000 gallons a month. It will specialize in the refining of material heretofore considered as waste oil.

The Elyria Enamelled Products Co., Elyria, Ohio, is clearing a site for its proposed two-story addition, 40 x 60 ft., to cost about \$10,000.

The Tuscora Rubber Co., City Bank Building, Wheeling, W. Va., capitalized at \$2,500,000, has arranged for a new plant at New Philadelphia, Ohio, for the manufacture of mechanical rubber products, including tubing, industrial hose, etc.

The Vapor Stove Co., Lima, Ohio, is planning for a one-story plant, 100 x 200 ft., for the manufacture of oil burning equipment. W. DeKalb, Holland Block, is engineer.

The Seneca Wire & Iron Co., Fostoria, Ohio, has filed plans for its proposed one-story addition, 167 x 208 ft., to cost \$100,000, including equipment.

The Reeves Mfg. Co., Dover, Ohio, is planning for a three-mile aerial tramway for coal from the company mines to the plant.

Considerable machinery will be installed in the new two-story addition to be erected at the plant of the Gummmed Products Co., Market Street, Troy, Ohio, manufacturer of gummmed tapes, etc., to be 100 x 140 ft., estimated to cost \$175,000.

Detroit

DETROIT, Aug. 2.

Machine tool deliveries are improving in this district, owing to a decided betterment of the railroad situation. The market, however, remains inactive, although a few orders are being placed. A number of plants have purchased machinery from the Government at prices ranging 15 per cent below the market.

A rumor to the effect that the Federal Motor Truck Co. and the Commercial Motor Car Co. were closing their plants has been officially denied. The Federal Motor Truck Co. states that it is operating on the greatest production schedule in its history.

The Bay City Screw Co., Bay City, Mich., has been organized by Henry Ullman and Henry S. McLavely, Flint. A plant has been established in Bay City to make valve lifters, tap-pet heads and other automobile parts.

The Continental Piston Corporation, Detroit, will move its plant to Midland, Mich., where it will occupy a part of the aircraft parts building. It machines rough piston castings for the Dow Metal Co.

The Atlas Tractor Co., Detroit, will move its plant to Adrian, Mich., and change its name to the Adrian Tractor Co. A plant will be erected with a floor space of 12,500 sq. ft.

The Jackson Cushion Spring Co., Jackson, Mich., will change its name to the Reynolds Spring Co. Wiley R. Reynolds, Jackson, has been made president following a reorganization. The plant is operating three nights a week and more than 100 men have recently been added to the force.

The Andrix Lock-Nut Co., Adrian, Mich., will start production on Sept. 1. A plant is being remodeled and machinery is being installed. At first only lock washers will be made, but as soon as additional equipment arrives, nuts will be made.

Plans have been completed for the erection of the plant of the Sauzedde Wire Wheel Corporation in Mt. Clemens, Mich. The first unit will cost about \$50,000 and will have a capacity of 3500 sets of wire wheels a year.

The New Haven Foundry Co., New Haven, Mich., has completed an addition 90 x 60 ft. An overhead track system is being installed to provide for the handling of one-ton ladles to all parts of the plant and to convey castings to the cleaning room.

The Saranac-Automatic Machine Corporation, capitalized at \$400,000, has been organized at Benton Harbor, Mich., to manufacture machinery. The incorporators are Edward Craig, E. C. Knott and F. L. Bradford.

The Albion Foundry & Machine Co., newly organized and capitalized at \$100,000, will take over the plant and property of the Union Steel Products Co., Marshall, Mich. Plans are being made for a new foundry.

The Standard Reamer & Tool Co., Detroit, has under construction a new foundry, 50 x 100 ft.

The Kalamazoo Spring & Axle Co., Kalamazoo, Mich., plans to increase its capacity six-fold, according to Christian Girard, president, and the entire plant will be remodeled. Considerable new machinery has been purchased. The name will be changed to the C. G. Spring Co., and it will be capitalized at \$100,000, with 10,000 shares of common stock of no par value.

The Andrix Lock-Nut Co., Adrian, Mich., of which Henry Andrix is president, expects to place its plant in operation about September 1, for the manufacture of lock washers and later will add equipment for making lock nuts. The company is remodeling a factory, thus providing 10,000 sq. ft. of floor space. It was recently incorporated at \$250,000.

The Detroit Belt & Locker Co., 27 A Street, Detroit, is taking bids for a one-story addition, 40 x 80 ft. Malcolm W. Edgar is secretary.

The Champion Ignition Co., Flint, Mich., manufacturer of spark plugs and ignition equipment, has completed plans for a new power plant for works service, to cost \$60,000.

The Water Department, Saginaw, Mich., has completed plans for a one and two-story machine and repair shop, with warehouse department, 52 x 80 ft., for municipal service, to cost \$30,000. Cowles & Mutscheller, Case Building, are architects.

The Pere Marquette Railroad Co., Saginaw, Mich., has had plans prepared for a new local engine house and repair shop.

The F. M. Foster Truck Co., 980 East Jefferson Avenue, Detroit, is having plans prepared for a new four-story service and repair building, 100 x 120 ft.

The Transport Truck Co., Mount Pleasant, Mich., manufacturer of motor trucks, is planning a new one-story addition, 90 x 240 ft.

Baltimore

BALTIMORE, AUG. 2.

The Virginia-Washington Lead & Zinc Corporation, 3 East Lexington Street, Baltimore, has been incorporated at \$375,000 to mine lead, zinc, etc., by Frank E. Welsh, Jr., Richard E. Preece and E. Harvey Peters.

For the purpose of engaging in the millwright and iron working business, A. Wilford & Co., Inc., Knickerbocker Building, Baltimore, has been incorporated at \$20,000 by Sarah A. Rohr, Edna M. Wilford and Albert Wilford, Sr.

The Pangborn Corporation, Hagerstown, Md., has increased its capital stock from \$260,000 to \$1,060,000.

The International Packing & Supply Co., Inc., 15 and 17 South Gay Street, Baltimore, has been incorporated at \$10,000 to install packing and engine room supplies to ships, etc., by Frank R. Pendleton, John A. Knight and Gerhard Boe.

The Union Shipbuilding Co., Fairfield, Baltimore, is constructing an additional marine railroad capable of handling vessels up to 10,000 tons deadweight.

A three-story, 111 x 118 ft. packing plant will be built by the Kaufman Beef Co., Union Stock Yards, Baltimore. Harry Kaufman is president.

Plans of the Prest-O-Lite Co., with main offices in New York, are said to include the construction of a plant for the manufacture of acetylene at Baltimore to cost \$75,000.

Bids are being received by the National Bitulithic Enamel & Paint Co., Woodall and Lawrence streets, Baltimore, for a three-story, 150 x 100 ft. plant.

Fire recently damaged the plant of the Edward Stinson Mfg. Co., manufacturer of wheels, spokes, rims, etc., 327 Guilford Avenue, Baltimore. The damage was about \$20,000 and will be repaired. Herman Loock is president.

The plant of the United States Asphalt Refining Co., East Brooklyn, Baltimore, was recently badly damaged by fire. A number of stills were destroyed.

The Norfolk & Western Railway, Norfolk, Va., plans to install electric machinery at its piers at Lamberts Point, Va. J. E. Crawford is chief engineer. The company also plans to increase its roundhouse facilities.

H. B. Worth, Greensboro, N. C., will receive quotations on used turning lathes, etc.

The Dillon Machine Shop, Columbia, S. C., has been incorporated at \$30,000. R. M. Oliver is president.

To manufacture automobile gears, axles, etc., the Columbia Machine Works, Main Street, Columbia, S. C., has been organized and will install machinery, including lathes, etc. J. E. R. Goodman is president and manager.

Plans for the construction of a factory building are being made by the Harris Accessory Co., Greenville, S. C., which was recently organized with \$50,000 capital stock. R. M. Varnon is secretary.

Prices on good second-hand locomotive cranes are wanted by R. C. Camp, Newberry, Fla.

The Mobile Tractor Co., Mobile, Ala., will build an additional plant unit for the manufacture of farm tractors.

The Talladega Mill & Plumbing Supply Co., Talladega, Ala., wants prices on pipe-threading machines, etc.

A public auction of machine tools, machine shop supplies, etc., will be held at the Aberdeen Proving Grounds, Aberdeen, Md., at 10:30 a.m., Aug. 6, by order of the Ordnance Department, U. S. Army. Details may be obtained from the commanding officer, Aberdeen Proving Ground, Md., or M. Fox & Sons Co., auctioneers, 20 South Paca Street, Baltimore.

The Central of Georgia Railway, Savannah, Ga., has awarded contract to George B. Swift & Co., Chicago, for new machine and repair shops, locomotive shops and roundhouse at Columbus, Ga., to cost about \$500,000, including equipment. C. K. Lawrence is chief engineer.

The Tate-Morrow Motor Co., Asheville, N. C., recently

organized is planning for the immediate establishment of a large repair works. The installation will include lathes, drill presses and other machine tools, with motor drive. Joseph B. Tate is president.

The Southern Power Co., Charlotte, N. C., is planning to rebuild its electric power plant at Albemarle, N. C., recently destroyed by fire.

The Republic Belting Co., 726 West Pratt Street, Baltimore, is completing plans for extensions and improvements in its three-story plant to cost about \$25,000.

The plant and business of the Maryland Pressed Steel Co., Hagerstown, Md., a subsidiary of the Poole Engineering & Machine Co., Woodberry, Baltimore, has been acquired by new interests. The purchasers will continue operations as heretofore, specializing in the manufacture of pressed steel parts. A new department will be added for the manufacture of electrical machinery and parts.

The Myers & Hicks Co., 30 South Paca Street, Baltimore, has been incorporated with a capital of \$100,000 by Thomas R. D. and Myron L. Myers, and J. W. McBride, to manufacture ovens and kindred equipment for bakers' service.

The Columbia Motor Car Corporation, 107 West Mount Royal Avenue, Baltimore, has acquired property at the corner of Calvert and Preston streets, for a consideration of about \$40,000. It is said that the site will be used for the erection of a new service and repair works.

The United Iron & Metal Co., 825 Greenmount Avenue, Baltimore, has acquired a site on Catherine Street, and has plans under way for a one-story building, 32 x 70 ft., to cost about \$10,000.

Milwaukee

MILWAUKEE, Aug. 2.

New business booked by local machine tool builders in July represented a fair volume, although somewhat smaller than the aggregate for June. The hesitancy of manufacturers to proceed with extension projects under existing financial conditions has been a principal factor in rendering business quiet. Inquiry, however, continues fairly active and orders for one or two machines are being received to piece out equipment or for replacement. The unfavorable railroad traffic situation is also a formidable obstacle to new business.

The Wetmore Reamer Co., Milwaukee, moved its factory and general offices from 210 Sycamore Street to its new \$75,000 plant at Twenty-seventh Avenue and Clybourn Street, the past week. It is inquiring for additional milling machine, lathe, surface grinder operators, toolroom hands, bench assemblers, etc., to increase the working force from 50 to 75 per cent immediately. It manufactures expanding reamers. C. P. Wetmore is vice-president and works manager.

The A. H. Petersen Mfg. Co., 1614 Fratney Street, Milwaukee, manufacturer of special machinery, tools, gages, fixtures and metal stampings, has increased its capitalization from \$50,000 to \$150,000. The works have been undergoing expansion for six months and new equipment is being installed from time to time.

The Globe Metal Products Corporation, Sheboygan, Wis., has increased its capital stock from \$200,000 to \$300,000 to finance extensions now being completed and accommodate its increasing business.

The Milwaukee Boiler Co., 220 Oregon Street, Milwaukee, established 30 years ago, is succeeded by the Milwaukee Boiler Mfg. Co., capitalized at \$200,000, organized to further develop the industry. It is negotiating for a site for a new plant, the present works having been outgrown and not being capable of adequate enlargement. Construction work probably will be undertaken before the end of the year. Officers of the new corporation are: President and general manager, W. D. Johnson; vice-president, Otto A. Ehbe; secretary-treasurer, Walter F. Mueller, all of whom have been associated with the old concern for many years. The company will continue to specialize in the manufacture of large boilers, tanks and heavy plate work.

The Heil Co., Twenty-sixth and Montana avenues, Milwaukee, is in the market for equipment for a one-story brick and steel shop addition, 136 x 275 ft., foundations for which are being completed. A contract for two 10-ton cranes, 40-ft. and 50-ft. respectively, has been placed with the Pawling & Harnischfeger Co., Milwaukee. A 12-ft. power brake suitable for $\frac{3}{4}$ -in. material has been purchased from the Dries & Krump Mfg. Co., Chicago. A 1-in. punch for $\frac{1}{2}$ -in. material, a $\frac{1}{2}$ -in. gate shear, and a 150-250-hp. boiler are other requirements not yet placed. The Heil Co. manufactures tanks, dump bodies for motor trucks, hydraulic hoists, etc. Julius P. Heil is vice-president and general manager.

The corporate style of the Andrew Motor Mfg. Co., 834

Muskego Avenue, Milwaukee, has been changed to Andrew Mfg. Co. The business was purchased several months ago by members of the Wehr Steel Co., Milwaukee, and will be continued as a commercial machine shop. C. Frederic Wehr is secretary.

The Kickhaefer Mfg. Co., 199-201 Oregon Street, Milwaukee, has broken ground for a two-story machine shop and factory, 60 x 140 ft., at Reed and Walker streets, and is buying additional equipment for manufacturing tools, dies, jigs, fixtures, special machinery, parts, etc. The investment will amount to about \$45,000. Edward A. Kickhaefer is president and general manager.

The Jacquet Motor Corporation, Manitowoc, Wis., has been incorporated for \$100,000 to manufacture commercial vehicles, engines and parts. It is a reorganization of a Michigan corporation of similar name, now operating at Belding, Mich., which is transferring its plant and offices to Manitowoc. The incorporators of the new concern are Alfred J. Jackson, Belding, and Frank M. Kadow and H. B. Kamschulte of Manitowoc.

The Modern Grinder Mfg. Co., 49-53 Oneida Street, Milwaukee, has increased its capital stock from \$25,000 to \$100,000. As soon as it is feasible, the company intends to build a machine shop with three to four times the capacity of the present leased shop.

The Piston Ring Co., Eau Claire, Wis., a new corporation with \$25,000 capital, has leased space and is buying equipment for manufacturing piston rings for explosive engines, as well as other automotive parts and accessories. It is hoped to get into production by Sept. 1 or 15. C. M. Pratt and E. L. Ross will be active managers of the business.

The White House Milk Products Co., West Bend, Wis., will erect a one-story brick and concrete addition, 50 x 115 ft., to its branch factory at Campbellsport, Wis. It will be equipped as a concentrating plant and will require two 150-hp. boilers and auxiliaries. H. M. Clark is general manager.

The Globe Plating Works, Manitowoc, Wis., established several months ago, has been incorporated with a capital stock of \$35,000. Michael Mrotek is president, and George Firsch, secretary-treasurer. Some new equipment is being installed from time to time.

The Kaukauna Machine Co., Kaukauna, Wis., manufacturer of power hammers and other machinery, is effecting a consolidation of interests with the Moloch Stoker Co., also of Kaukauna, and manufacturing automatic stoking equipment for boilers. A new issue of \$100,000 common stock is being marketed to finance enlargement of the plant and equipment.

The Stinson Tractor Co., Minneapolis, is erecting a brick and frame addition to its main works at Superior, Wis., to provide increased capacity until the erection of a new plant at Eau Claire, Wis., can be taken up again. It was postponed several months ago because of existing conditions. Joseph J. Ott of Eau Claire is president.

The Vaporetor Corporation, Milwaukee, has been incorporated with a capital stock of \$300,000, to manufacture automotive equipment, accessories and parts. The incorporators are represented by Nathan W. Klein, James Barels and Thomas T. Churchill, attorney, 425 East Water Street. Further details are not yet available.

The city of Goodman, Marinette County, Wis., has authorized a bond issue of \$150,000 for the construction and equipment of a new high school and vocational training institute. An architect will be selected at once.

The J. I. Case Plow Works Co., Racine, Wis., has started work on the construction of a four-story factory, 123 x 138 ft., at Mead and Water streets, to be used mainly for manufacturing motor trucks for farm purposes. Work will begin shortly on two additional shop buildings, which with new foundries under construction will represent an aggregate investment of more than \$1,000,000.

The Holm Radiator Corporation, Milwaukee, has been incorporated for \$50,000 to manufacture and repair automobile, truck and tractor radiators. The incorporators are Fred W. Krueck, W. V. Simmons and Harry H. Holm, 283 Third Street.

The Boscobel Table Mfg. Co., Boscobel, Wis., is erecting a new factory, dry kilns, engine and boiler house and stack, and will install considerable new woodworking machinery in addition to the equipment of its present plant.

The Oneida Motor Truck Co., Green Bay, Wis., on Aug. 1 took occupancy of its No. 2 factory, duplicating the original plant and costing about \$175,000. The new building will be used for receiving and material assembly, manufacture of bodies, sheet metal parts, radiators, etc., for which much additional machinery is being purchased. Lafayette Markle is president and general manager.

The Columbia Rubber Mills, 176 Sixteenth Street, Milwaukee, has engaged Juul & Smith, architects, Sheboygan, Wis., to design a new factory to be erected in Sheboygan. It will be 67 x 100 ft. and 70 x 100 ft., ell-shaped, with a power house, 30 x 40 ft. The cost is estimated at \$75,000.

Pittsburgh

PITTSBURGH, Aug. 2.

The new plant of the Steel City Electric Co., 1207 Columbus Avenue, Northside, Pittsburgh, manufacturer of electrical products, will be three stories, 48 x 55 ft., and serve as an extension to the present factory. It will cost about \$30,000. W. F. Trimble & Sons, 1719 Pennsylvania Avenue, have the construction contract. W. J. Patterson is president.

The Globe Aerial Transportation Co., Pittsburgh, has been incorporated in Delaware with capital of \$5,000,000 by George K. Linderman, William P. Martin and George W. Mulry, all of Pittsburgh, to manufacture aircraft of various types, parts, etc.

The Warren Tank Car Co., Warren, Pa., has been incorporated with a capital of \$100,000 by B. H. Mathis and associates to manufacture tank cars and railroad equipment.

The Pittsburgh Screw & Bolt Co., Pittsburgh, has filed plans for a new three-story, reinforced-concrete building on Preble Avenue, Northside, to cost about \$20,000, exclusive of equipment.

The Keystone Driller Co., Eighth Avenue, Beaver Falls, Pa., manufacturer of pumping machinery, valves, and similar equipment, has construction under way on additions to its plant, including a new machine shop, foundry, and iron-working shop for pump manufacture, estimated to cost about \$150,000.

The F. Tinsbrusk-Sour Co., Pittsburgh, has filed plans for a one-story brick and steel machine shop at Fifty-seventh and Harrison streets, to cost about \$15,000, exclusive of equipment.

The Reynolds Motor Co., Carnegie, Pa., has been incorporated in Delaware with capital of \$100,000 by H. J. Hoban and E. G. Welch, Carnegie, and W. E. Pfaffer, Grafton, Pa., to manufacture automobile parts and equipment.

The Princeton Foundry & Supply Co., Princeton, W. Va., has been incorporated with a capital of \$50,000 by G. H. Crumpecker and L. E. White, Princeton, and C. W. Hall, Keystone, W. Va., to manufacture iron and steel castings, machinery and parts.

The Miller Rubber Co., Akron, Ohio, manufacturer of automobile tires and other products, is planning for a new four-story plant at its recently acquired site at Nitro, W. Va., estimated to cost about \$400,000 with equipment.

The Pacific Northwest

SEATTLE, July 27.

Manufacturing conditions in this district show little change, car congestion and lack of new buying repressing new activity to some extent. Buying in all lines has been extremely conservative, but manufacturers believe this condition is only temporary, and where storage space is available are turning out their products at normal capacity.

The labor situation is good, with the exception of unskilled labor, for which the demand exceeds the supply at present.

The Rohn Furnace Works, Inc., Portland, has been incorporated for \$10,000 by C. A. Rohn, W. D. Richards and others. It will manufacture furnaces and machinery.

The foundry of the Bayside Iron Works, Everett, Wash., was destroyed by fire recently, with loss of \$12,000. It will be rebuilt immediately. C. J. Witney is president.

The plant of the North Shore Light & Power Co., Tukwila, Wash., was completely destroyed in a recent fire. It will be rebuilt.

The Ohio Match Co., represented in Spokane by Fred Shore, has purchased a 3200 acre tract at Metaline, Wash., on which will be erected three circular sawmills at a cost of \$150,000.

The Pacific Coast Shovel Co., Everett, Wash., headed by Olaf Hellestater, president, contemplates the erection of a plant for the manufacture of a three-in-one caterpillar excavator, or gasoline shovel. It is capitalized at \$150,000.

The Puritan Rubber Co., Yakima, Wash., headed by P. E. Skaggs, contemplate the erection of a plant in the Yakima Valley for the manufacture of automobile tires and other rubber products.

The plant of the National Copper Co., Mullan, Idaho, was damaged by fire recently, caused by lightning. The loss is placed at \$25,000 including the compressor buildings, two compressors and other machinery.

The Seattle Standard Engine Mfg. Co., Seattle, has purchased the patent rights to the Hallin reverse gear which it will manufacture. For the present only one size will be made, that which is especially suited for lightweight, medium speed engines ranging from 4 to 8-hp.

Hugh J. and Paul Armstrong of Armstrong Brothers & Co., Chicago, manufacturers of tools, have purchased 5200 ft. of water frontage on the west side of Young's Bay at Astoria, Ore. No announcement has yet been made as to the use to which the new site will be put. The Armstrong company purchased 100 ft. of water frontage adjoining this one last April.

The Gulf States

BIRMINGHAM, Aug. 2.

The Rex Motor Car Co., 628 Gravier Street, New Orleans, is having plans prepared by R. S. Soule, architect, 429 Carondolet Street, for its new plant at Shrewsbury, near New Orleans. It recently increased its capital from \$250,000 to \$1,000,000.

The Beaumont Iron Works, Beaumont, Tex., has plans under way for a number of additions to cost about \$200,000. The work will include a new main building, one-story, 40 x 170 ft., to be used as a foundry and pattern shop; three-story adjoining building for machine work and general service, with storage department. The installation will consist of foundry equipment, machine tools, electric traveling cranes and other apparatus. The company recently increased its capital from \$225,000 to \$700,000. L. J. Black is president. Robert Cummings, Houston, Tex., is engineer.

The Hall Foundry & Machine Co., Jacksonville, Tex., has been incorporated with a capital stock of \$60,000 by F. L. Haberle, S. J. Hall and J. C. Beard, to manufacture iron and steel castings, machinery, parts, etc.

As a site for its new oil refinery, the Cogswell Refining Co., Parsons Building, Henryetta, Okla., has acquired 12 acres on the outskirts of the city. It will obtain its supply of crude petroleum from the Burk Burnett field, Texas, and will supplement its initial refining plant, estimated to cost close to \$1,000,000, including equipment, at a later date with a compounding works for the production of lubricating oils and solid products. John F. Cogswell is president and T. T. Martin general manager.

The Gay Mfg. Co., Jasper, Fla., has been incorporated with a capital stock of \$50,000 by W. M. Gay, C. L. Price and S. M. Perkins to manufacture machinery and parts.

The Texas & Pacific Railway Co., Dallas, Tex., is planning for the erection of a new machine and repair shop at Marshall, Tex., to cost about \$50,000. E. F. Mitchell is chief engineer.

The Fort Payne Stove & Foundry Co., Fort Payne, Ala., is planning to immediately rebuild its plant, recently destroyed by fire.

The Four States Refining Co., Texarkana, Tex., recently incorporated, is planning the erection of a new refinery with initial capacity of about 300 bbl. per day. Louis Heilbron and C. E. Palmer head the company. George M. White is engineer.

The Mobile Tractor Co., Mobile, Ala., manufacturer of motor-driven farm tractors, has plans under way for a new one-story plant. Walter S. Gaines is chief engineer.

A new automobile service and repair works, 140 x 150 ft., to cost about \$100,000 with equipment, will be erected by the 555 Tire & Service Co., 1100 Main Street, Little Rock, Ark., recently organized. R. E. Steuber is president and F. J. Vanderburg, treasurer.

The San Antonio Cotton Mills, San Antonio, has been incorporated with a capital stock of \$500,000 by J. O. Chapman, E. A. DuBose and Harry H. Rogers.

The Southern Pipe Line & Refining Co., Santa Anna, has been incorporated with a capital stock of \$100,000 by R. M. Darnell, R. R. Menaugh and M. H. Franklin.

The Texas & Pacific Coal & Oil Co., Thurber, has increased its capital stock from \$6,000,000 to \$8,120,000 and plans to build a large refinery.

A paving brick and pottery plant will be erected at Cisco by the Cisco Clay & Coal Co. on a 160-acre tract east of the town. The company will also develop two 30-in. veins of coal. The plant will have a capacity of 50,000 bricks per day. A short spur to the lines of the Cisco & Northeastern Railroad will also be built by the company.

The Dublin Compress Co., Dublin, has been incorporated at \$100,000 by Lewis Moore, M. D. Smith and J. S. Perkins.

The Farmers Electric Gin Co., Holland, has been incor-

porated at \$15,000. Incorporators are C. B. Starke, J. P. Edwards and W. A. McKee.

Charles Brewington, Stanford, and C. C. Frampton, Coleman, are interested in the erection of a brick plant at Eastland. The proposed plant will cost \$50,000.

Extensive improvements will be made by the Dallas Power & Light Co., according to J. F. Strickland, president of the organization. The work will include extensions and betterments to the power plant, the construction of a new warehouse and garage, a new cooling system at the power plant and additions and improvements at the East Dallas substation.

Negotiations are under way between the United Zinc Smelter Co. and the Board of City Development of Amarillo for the location of a smelter there.

The Gulf Coast Tile & Marble Co. has been incorporated at Houston at \$12,000 by H. A. Bybee, Scott Shambaugh and Tony Albert.

The Big Three Welding & Equipment Co., Fort Worth, has been incorporated at \$12,000 by C. K. Rickel, B. K. Smith and C. E. Goss.

The Hall Foundry & Machine Co. has been incorporated at Jacksonville at \$60,000 by S. J. Hall, F. L. Haberle and J. C. Beard.

The Knox Gin Co. has been incorporated at Krum at \$30,000 by A. H. Knox, R. E. Patterson and A. H. Knox, Jr.

Canada

TORONTO, Aug. 2.

The warm weather and the holiday season has brought about a slight falling off in the demand for machinery and tools in the Canadian market. This is the general tendency, but there are a few cases where a brisk demand for equipment is reported, and taking business on the whole dealers are well satisfied with the outlook. The demand for single tools and special equipment is quite active. Several of the inquiries are for machines to turn out a special piece of work, preferably by automatic operations. The Canadian National Railways, purchasing department, 9 Toronto Street, Toronto, Ont., has issued a list for small tools required for the Moncton, N. B., shop, and according to one official of the railroad company, they are in the market most of the time for some special equipment and tools. Deliveries of tools continue uncertain, and in a number of instances manufacturers are being held up on account of the slow delivery on some heavy tools from the United States. Deliveries of tools and machinery from England have been showing a decided improvement and British tool makers are going after business in the Canadian market vigorously. Many Canadian firms are more anxious to cultivate business dealing with British manufacturers, as in many cases their supplies are less costly than those produced in the United States and Canada. Some local dealers are reporting advances on many lines of United States equipment and it is expected that machinery and tools will reach even higher levels if increased freight rates become effective.

At the special general meeting of shareholders of the Canada Foundries & Forgings Co., recently held in Brockville, Ont., approval was given to the recommendation of the board of directors involving the acquisition of the Mann Axe & Tool Co., St. Stephen, N. B. If negotiations now being conducted with the municipality of St. Stephen are concluded satisfactorily, the Mann plant will be rebuilt without delay. The business will be conducted under the name of the Mann Axe Co., in which the Canada Foundries & Forgings Co. will own a controlling interest.

The Brantford Washing Machine Co., Ltd., Brantford, Ont., has been incorporated with a capital stock of \$100,000 by Robert A. Lyons, Stephen A. Jones and others to manufacture electric washing machines and other electrical appliances, etc.

The Markham Milling & Manufacturing Co., Ltd., Markham, Ont., is in the market for a 15 and 20-hp. motor.

The Parkinson Cereal Co., Thornbury, Ont., is in the market for one 15-in. ball-bearing Moore grinder.

The Bell Thread Co., Ltd., Hamilton, Ont., is in the market for a return tubular boiler, 6 x 16 ft., complete.

The Shinn Mfg. Co. of Canada, Ltd., Guelph, Ont., has started work on a three-story addition, 30 x 70 ft. The output of lightning rods will be more than doubled.

The Stansell Motors, Ltd., Amherstburg, N. S., recently formed with a capital stock of \$500,000, has secured a 10-year lease on a building erected several years ago for the manufacture of automobiles. At first only assembling will be done, but it is expected to go into the manufacture of cars at a later date. The directors of the company are J. B. Whitley, Detroit, president; W. R. Stansell, Amherst-

burg, vice-president and general manager; F. P. Davey, Detroit, secretary-treasurer. J. C. Veale, Detroit, and F. A. Parke, mayor of Amherstburg, are directors.

The Davis-Bourbonville Co. has moved into its new plant at 32 Eastern Avenue, Toronto. The building is 50 x 110 ft., two stories, and will be used for the production of equipment for the Canadian trade. If the situation warrants, a welding school will be established in connection with the plant.

Wells Brothers of Canada, Ltd., Galt, Ont., manufacturer of taps, dies, screw plates, etc., has changed its name to the Greenfield Tap & Die Corporation of Canada, Ltd., and is increasing its capital stock from \$40,000 to \$250,000. It will erect new buildings and increase the output of its commodities.

The Canadian General Electric Co., 212 King Street West, Toronto, will build a factory at the corner of Wallace and Ward avenues, to cost \$400,000.

The Canadian Abrasive Co., Victoria, B. C., will establish a plant to cost \$50,000 including equipment. Among those interested are: J. L. Near, Major Martyn and Mr. Moore of the Canadian Explosives, Ltd.; Capt. D. S. Bullock, Col. Lorne Ross and others.

Contract for the construction of the \$3,000,000 dry dock by Coughlan & Sons on Burrard Inlet, Vancouver, B. C., has been let, and it is expected that construction will be started within 60 days.

The Riordan Pulp & Paper Co., Ltd., 355 Beaver Hall Square, Montreal, contemplates the erection of a pulp and paper mill at Chelsea, Que.

The Fort William Pulp & Paper Co., Fort William, Ont., is making arrangements for the construction of pulp and paper mills to cost \$2,000,000. John G. Sutherland, Dayton, Ohio, is president of the company.

The Bruce Stewart Co., Charlottetown, P. E. I., will build a machine shop in connection with its foundry and has let the general contract to E. E. Parkman & Son, 13 Euston Street.

The Corbet Foundry & Machine Co., Owen Sound, Ont., is receiving bids for a new foundry and expects to be in the market at an early date for the necessary machinery and equipment.

John Breakey, Breakeyville, Que., is interested in a company recently formed with a capital stock of \$5,000,000 to erect a pulp mill at Levis, Que.

The Orton Motor Co., Ltd., Petrolia, Ont., will call for bids about Aug. 16 for an addition to its plant to cost \$25,000. Machinery will also be required. A. Orton is manager.

The Dominion Steel Corporation, Sydney, N. S., contemplates the construction of a power plant. Roy M. Wolvin, 112 St. James Street, Montreal, is president.

Dr. H. A. Cox, Acton, Ont., will receive bids until Aug. 9, for motor-driven centrifugal pumps, etc. Plans are at the office of the engineer, E. A. James, Co., Ltd., 1004 Excelsior Life Building, Toronto.

The Colonial Radiators, Ltd., Hamilton, Ont., has been incorporated with a capital stock of \$40,000 by James N. Bicknell, 95 Strathmore Boulevard; Albert O. L. Burnese, 109 Neville Park Boulevard; Robert J. O'Reilly and others, all of Toronto, to manufacture motor vehicles, radiators, fenders, etc.

The Aylmer Products, Ltd., Aylmer, Ont., has been incorporated with a capital stock of \$500,000 by David L. Grant, Bank of Hamilton Building; Edwin Smily, 67 Gloucester Street; James S. Bell and others all of Toronto, to manufacture scales, pumps, machinery, etc.

The Belanger Foundry, Ltd., Montreal, has been incorporated with a capital stock of \$100,000, by Auguste Jean, Ulric Genest, Ovide D'Amour and others to acquire and take over the plant and business of the firm of O. Belanger, Enregistree, and to carry on the business of manufacturers of iron, steel, machinery, tools, implements, etc.

Adcock & Brewer, Ltd., Montreal, Que., has been incorporated with a capital stock of \$24,000, by Louis P. Crepeau, Maurice Dugas, S. H. R. Bush and others, to manufacture hardware, machinery, tools, metals, iron, steel, etc.

The Joliette Castings & Forgings, Ltd., Montreal, Que., has been incorporated with a capital stock of \$1,000,000 by Alexander H. Duff, Walter A. Merrill, Archibald Stalker and others to manufacture iron, steel, castings, forgings, machinery, tools, implements, etc.

The Canadian Incinerator & Furnace Co., Ltd., Toronto, Ont., has been awarded the contract for an oil-burning plate furnace to be erected in the boiler shop of the E. Leonard & Sons, Ltd., London, Ont. The company is adding up-to-date equipment to their plant for stamping boiler heads, etc.

BOOK REVIEWS

Ordnance and the World War. By Major-General William Crozier, U. S. A. Pages xii + 292, 8 x 5½ in. Published by Charles Scribner's Sons, New York.

Naturally as chief of ordnance before and after we went into the great war, General Crozier had to bear the brunt of criticism directed toward his bureau and, as everybody will remember, back in the latter part of 1917 and the early part of 1918 that criticism was descending upon his head in great volume. In this book General Crozier goes into great detail to defend his course and to show that the shortages in war equipment and materials, such as artillery, rifles, machine guns and smokeless powder, can really be laid to shortsighted legislators in Congress who for years before we came into the great conflict ignored the repeated pleas of General Crozier for increased armament and better ordnance facilities. In the development of no activity of war, General Crozier points out, is preparedness so necessary as in the preparation of guns and other weapons and in the building of plants and equipment for their production in the large quantities needed for modern warfare.

After reading the evidence submitted in this book one is convinced in particular that the criticisms made by Senators Chamberlain and Waugh were not only too carping but quite unfair. Had Secretary Baker granted General Crozier's request for a court of inquiry to go into the famous Lewis machine gun controversy, something different from the view put out in the newspapers would have resulted. Data from tests of the Lewis machine gun quoted in the book indicate that early models had been thoroughly tried out in fair competition with other makes.

By far the larger section of the 292 pages is devoted to the Lewis machine gun controversy, the chapter on machine guns taking up 129 pages. Testimony by Colonel Lewis himself before the Senate committee is copiously quoted. The chapter, in fact, takes on the aspect of a general review, and Colonel Lewis's side of the case as given in the Senate testimony, as well as General Crozier's, is presented in much detail. Separate chapters dealing with rifles, field artillery and smokeless powder cover the criticisms made by members of Congress and others on the breakdown in production of these materials at the beginning of the war.

After all, General Crozier concludes, the failure of Congress to prepare the nation for war was due to general apathy of the people themselves toward this subject. It was impossible, in fact, to get the people to build up an attitude favorable to preparedness for war. It was only a few whose business it was to make a close study of war who could foresee the need.

Handbook of Deutsche Metall-Industrie Zeitung for 1920. Pages 700, 5½ x 9 in. Published by the Deutsche Metall-Industrie Zeitung, of Remscheid, Germany.

A large part of the 700 pages of this handbook is devoted to advertisements of German firms interested in the iron and steel industry. The book is divided into five sections, the first of which is entitled technical and devoted to treatises and reviews by representative professional Germans. The second section contains reviews on the economical situation in Germany as it is affected by the attitude of other countries and special reviews on the iron, machine, chemical, textile, wool, silk, jute and rubber industries. It also contains special chapters on the metal market during the World War, and on copper, tin, zinc, lead and silver. The third section is made up of 24 pages and is devoted entirely to reproductions of trade marks. To any one wishing to familiarize himself with foreign trade marks, this section should prove of considerable interest. The fourth and fifth sections, entitled market index and general advertising sections, take up 192 pages and 304 pages respectively.

The Condensed Chemical Dictionary. Compiled and edited by the editorial staff of the *Chemical Engineering Catalog*. Pages 525, 6½ x 9¾. Published by the Chemical Catalog Co., Inc., 1 Madison Avenue, New York.

This book aims to supply the needs of those persons and industries not educated along chemical lines and thus furnish them with detailed information regarding chemicals and chemical products. The work has been under the direct charge of F. M. Turner, Jr., technical editor of the staff mentioned above, assisted by D. D. Berolzheimer, W. P. Cutter and John Helfrich. The results amply fulfill the needs described and meet the aims of the promoters. The information thus carefully assembled will be of value to exporters and importers particularly as well as many other interests. The largely increasing number of inquiries received by the information bureau of the catalog company made evident the need of some such book. All the principal chemicals are defined and carefully cross-indexed.

New Books Received

A Metallographic Study on Tungsten Steels, by Axel Hultgren. Pages 95, 5¾ x 9 in., plus 38 additional sheets bearing 76 photomicrographs. Published by John Wiley & Sons, Inc., New York.

Tin, Sheet-Iron and Copper-Plate Worker, by Leroy J. Blinn. Pages 334, 4¾ x 7½ in.; numerous illustrations. Published by Henry Carey Baird & Co., Inc., 2 West Forty-fifth Street, New York.

Vocational Arithmetic, by C. E. Paddock and E. E. Holton. Pages 232, 4¾ x 7 in.; diagrams. Published by D. Appleton & Co., New York.

Motion Study for the Handicapped, by Frank Gilbreth and Lillian Moller Gilbreth. Pages 165, 5½ x 8½ in.; numerous illustrations. Published by E. P. Dutton & Co., 681 Fifth Avenue, New York.

Standard Electrical Dictionary, by T. O'Connor Sloane. Pages 767, 4¾ x 7 in.; illustrations. Published by Norman W. Henly Publishing Co., 2 West Forty-fifth Street, New York.

America and the New Era, a symposium on social reconstruction. Edited by Elisha M. Friedman, with a foreword by Herbert Hoover. Pages 500, 5¾ x 8 in. Published by E. P. Dutton & Co., 681 Fifth Avenue, New York.

Technical Book Review Index—records of reviews of scientific and technical books reviewed in periodical, issued by the technology department of the Carnegie Library, Pittsburgh.

Metal Statistics, 1920—Thirteenth annual edition, published by the American Metal Market and the Daily Iron and Steel Report, 81 Fulton Street, New York.

Transactions, American Society of Heating and Ventilating Engineers—Vol. 25, published by the society, 29 West Thirty-ninth Street, New York.

A second and revised edition of the book, "Fifty Years of Iron and Steel," by Joseph G. Butler, Jr., veteran iron and steel manufacturer of the Mahoning Valley, is now on the press. The new edition contains two additional chapters, one on the part the American steel industry played in the world war, and the other on the dissolution suit against the Steel Corporation. The article discusses the beneficial effects of this decision on business in general. Mr. Butler read the chapter entitled "American Steel in the World War," at the annual meeting of the American Iron and Steel Institute in New York. Copies of the book will be distributed among colleges, universities and libraries.

Arthur G. McKee & Co., engineers and contractors, Cleveland, have received orders from the Cambria Steel Co. for furnishing two McKee revolving stock distributors for the No. 7 and No. 8 furnaces at Johnstown, Pa. The furnaces will also be equipped with electrical bell operating equipments. The Ford Motor Co. has placed an order with the McKee company for six Kling goggle valves.

Current Metal Prices

On Small Lots, from Merchants' Stocks, New York City

The quotations given below are for small lots, as sold from stores in New York City by merchants carrying stocks.

As there are many consumers whose requirements are not sufficiently heavy to warrant their placing orders with manufacturers for shipment in carload lots from mills, these prices are given for their convenience.

On a number of articles the base price only is given, it being impossible to name every size.

The wholesale prices at which large lots are sold by manufacturers for direct shipment from mills are given in the market reports appearing in a preceding part of THE IRON AGE under the general headings of "Iron and Steel Markets" and "Metal Markets."

Iron and Soft Steel Bars and Shapes		
Bars:		Per Lb.
Refined iron, base price	.....	5.25c.
Swedish bars, base price	.....	20.00c.
Soft Steel:		
$\frac{3}{4}$ to $1\frac{1}{8}$ in., round and square	.....	3.52c. to 5.25c.
1 to 6 in. x $\frac{3}{8}$ to 1 in.	.....	3.52c. to 5.25c.
1 to 6 in. x $\frac{1}{4}$ to $5/16$.	.....	3.62c. to 5.25c.
Rods— $\frac{5}{8}$ and $11/16$.	.....	3.57c. to 5.05c.
Bands— $1\frac{1}{2}$ to 6 by $3/16$ to No. 8	.....	4.22c. to 6.50c.
Hoops	.....	5.57c. to 6.57c.
Shapes:		
Beams and channels—3 to 15 in.	.....	3.47c. to 5.25c.
Angles:		
3 in. x $\frac{1}{4}$ in. and larger	.....	3.47c. to 5.25c.
3 in. x $3/16$ in. and $\frac{1}{8}$ in.	.....	3.72c. to 5.60c.
$1\frac{1}{2}$ to $2\frac{1}{2}$ in. x $\frac{1}{8}$ in.	.....	3.52c. to 5.90c.
$\frac{1}{2}$ to $2\frac{3}{4}$ in. x $3/16$ in. and thicker	.....	3.47c. to 5.85c.
1 to $1\frac{1}{4}$ in. x $3/16$ in.	.....	3.52c. to 5.90c.
1 to $1\frac{1}{4}$ x $\frac{1}{8}$ in.	.....	3.57c. to 5.95c.
$\frac{7}{8}$ x $\frac{7}{8}$ x $\frac{1}{8}$ in.	.....	3.62c. to 6.00c.
$\frac{3}{4}$ x $\frac{1}{8}$ in.	.....	3.67c. to 6.05c.
$\frac{5}{8}$ x $\frac{1}{8}$ in.	.....	4.07c. to 6.85c.
$\frac{1}{2}$ x $3/32$ in.	.....	5.17c. to 7.55c.
Tees:		
1 x $\frac{1}{8}$ in.	.....	3.87c. to 6.25c.
$1\frac{1}{4}$ in. x $1\frac{1}{4}$ x $3/16$ in.	.....	3.77c. to 6.15c.
$1\frac{1}{2}$ to $2\frac{1}{2}$ x $3/16$ in. and thicker	.....	3.57c. to 5.95c.
3 in. and larger	.....	3.52c. to 5.30c.
Merchant Steel		Per Lb.
Tire, $1\frac{1}{2}$ x $\frac{1}{2}$ in. and larger	.....	5.00c. to 5.25c.
(Smooth finish, 1 to $2\frac{1}{2}$ x $\frac{1}{4}$ in. and larger)	.....	5.50c.
Toe calk, $\frac{1}{2}$ x $\frac{3}{8}$ in. and larger	.....	6.00c.
Cold-rolled strip (soft and quarter hard)	.....	12c. to 14c.
Open-hearth spring steel	.....	7.00c. to 10.00c.
Shafting and Screw Stock:		
Rounds	.....	6.25c. to 7.00c.
Squares, flats and hex.	.....	6.75c. to 7.50c.
Standard cast steel, base price	.....	15.00c.
Best cast steel	.....	20.00c. to 24.00c.
Extra best cast steel	.....	25.00c. to 30.00c.
Tank Plates—Steel		Per Lb.
$\frac{1}{4}$ in. and heavier	.....	3.67c. to 5.50c.
Sheets		
Blue Annealed		Per Lb.
No. 10	.....	7.12c. to 8.30c.
No. 12	.....	7.15c. to 8.35c.
No. 14	.....	7.22c. to 8.40c.
No. 16	.....	7.32c. to 8.50c.
Box Annealed—Black		
Soft Steel		
C.R., One Pass	Wood's	
Per Lb.	Refined,	Per Lb.
Nos. 18 to 20	.....	8.30c. to 9.90c.
Nos. 22 and 24	.....	8.35c. to 9.85c.
No. 26	.....	8.40c. to 9.90c.
No. 28	.....	8.50c. to 10.00c.
No. 30	.....	8.60c. to 10.10c.
No. 28, 36 in. wide, 10c. higher.		
Galvanized		Per Lb.
No. 14	.....	8.75c. to 11.00c.
No. 16	.....	9.00c. to 11.25c.
Nos. 18 and 20	.....	9.15c. to 11.40c.
Nos. 22 and 24	.....	9.30c. to 11.55c.
No. 26	.....	9.45c. to 11.70c.
No. 27	.....	9.60c. to 11.85c.
No. 28	.....	9.75c. to 12.00c.
No. 30	.....	10.25c. to 12.50c.
No. 28, 36 in. wide, 20c. higher.		
Pipe		
Standard—Steel		
Blk. Galv.		
$\frac{1}{2}$ in. Butt... —36 —19	$\frac{3}{4}$ - $1\frac{1}{2}$ in. Butt. —5 +15	
$\frac{3}{4}$ - $1\frac{1}{2}$ in. Butt. —40 —24	2 in. Lap.... +1 +19	
$3\frac{1}{2}$ -6 in. Lap. —35 —20	$2\frac{1}{2}$ -6 in. Lap. —1 +15	
7-12 in. Lap.. —25 —8	7-12 in. Lap.. +10 +28	
Wrought Iron		

Steel Wire		
BASE PRICE* ON NO. 9 GAGE AND COARSER		Per Lb.
Bright basic	.....	8.00c.
Annealed soft	.....	8.00c.
Galvanized annealed	.....	8.50c.
Coppered basic	.....	8.50c.
Tinned soft Bessemer	.....	10.00c.

*Regular extras for lighter gages.

Brass Sheet, Rod, Tube and Wire

BASE PRICE		
High brass sheet	.....	28 $\frac{1}{4}$ c. to 29 $\frac{1}{2}$ c.
High brass wire	.....	28 $\frac{1}{4}$ c. to 29 $\frac{1}{2}$ c.
Brass rod	.....	26 $\frac{3}{4}$ c. to 29 c.
Brass tube	.....	43 $\frac{1}{2}$ c. to 45 $\frac{1}{2}$ c.

Copper Sheets

Sheet copper, hot rolled, 24 oz., 29 $\frac{1}{2}$ c. per lb. base. Cold rolled, 14 oz. and heavier, 2c. per lb. advance over hot rolled.

Tin Plates

Bright Tin	Grade	Grade	Coke—14x20 Primes Wasters
"AAA"	"A"	80 lb... 11.80	11.55
Charcoal	Charcoal	90 lb... 11.90	11.65
14x20	14x20	100 lb... 12.00	11.75
IC... \$16.50	\$14.25	IC... 12.25	12.00
IX... 18.75	16.25	IX... 13.25	13.00
IXX... 20.50	18.00	IXX... 14.25	14.00
IXXX... 22.25	19.75	IXXX... 15.25	15.00
IXXXX... 23.75	21.50	IXXXX... 16.25	16.00

Terne Plates

8-lb. Coating 14 x 20	
100 lb.	... .95
IC	... .90
IX	... 10.50
Fire door stock	... 12.75

Tin

Straits pig	
Bar	... 60c. to 62c.

Copper

Lake ingot	
Electrolytic	... 19 $\frac{1}{2}$ c.
Casting	... 19 $\frac{1}{2}$ c.

Spelter and Sheet Zinc

Western spelter	
Sheet zinc, No. 9 base, casks	... 14 $\frac{1}{2}$ c. open 15c.

Lead and Solder*

American pig lead	... 10c. to 10 $\frac{1}{2}$ c.
Bar lead	... 11c. to 12c.
Solder $\frac{1}{2}$ and $\frac{1}{4}$ guaranteed	... 38c.
No. 1 solder	... 32c.
Refined solder	... 31c.

*Prices of solder indicated by private brand vary according to composition.

Babbitt Metal

Best grade, per lb.	... 10c.
Commercial grade, per lb.	... 10c.

Antimony

Asiatic	... 9 to 10c.
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Aluminum

No. 1 aluminum (guaranteed over 99 per cent pure), in ingots for remelting, per lb.	... 35c. to 38c.
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Old Metals

The week has been a slow one, dealers recording business light. Prices are easing off a little with the exception of lead which remains firm. Dealers' buying prices are as follows:

Copper, heavy and crucible	... 15.75
Copper, heavy and wire	... 15.50
Copper, light and bottoms	... 13.00
Brass, heavy	... 10.00
Brass, light	... 7.50
Heavy machine composition	... 15.25
No. 1 yellow brass turnings	... 9.50
No. 1 red brass or composition turnings	... 12.25
Lead, heavy	... 7.50
Lead, tea	... 5.00
Zinc	... 5.25

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9½c.
9½c.
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15½c.

base.
over

fasters
11.55
11.65
11.75
12.00
13.00
14.00
15.00
16.00

\$9.35
.. 9.50
.. 10.50
.. 12.75

.. 55c.

.. 62c.

.. 20c.

.. 19½c.

.. 19¾c.

.. to 11c.

pen 15c.

to 10½c.

c. to 12c.

.. 38c.

.. 35c.

.. 31c.

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90c.

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Cents
per lb.
15.75
15.00
13.00
10.00
7.50
15.25
9.50
12.25
7.50
5.00
5.25